

# City of San Marcos Climate Action Plan

Adopted by City Council Resolution September 10, 2013





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AB Assembly Bill

CAL FIRE California Department of Forestry and Fire Protection

CALGreen California Green Building Standards Code Caltrans California Department of Transportation

CAP Climate Action Plan

CARB California Air Resources Board

CCSE California Center for Sustainable Energy
CEQA California Environmental Quality Act

CH<sub>4</sub> Methane

CO<sub>2</sub> Carbon dioxide

CO<sub>2</sub>e Carbon dioxide equivalent
EDCO Escondido Disposal Corporation
EIR Environmental Impact Report
EPA Environmental Protection Agency

GHG Greenhouse gas

HVAC Heating, ventilating, and air conditioning IPCC Intergovernmental Panel on Climate Change

kWh Kilowatt hours LED Light-emitting diode

LEED Leadership in Energy and Environmental Design

LCFS Low Carbon Fuel Standard

MPG Miles per gallon

MPO Metropolitan planning organization

MT Metric tons

NCTD North County Transit District

PV Photovoltaic

SANDAG San Diego Association of Governments

SDG&E San Diego Gas and Electric

SB Senate Bill

TDM Transportation demand management

VMT Vehicle miles traveled





The City of San Marcos Climate Action Plan (CAP) is a long-range plan to reduce greenhouse gas (GHG) emissions from City government operations and community activities within San Marcos and prepare for the anticipated effects of climate change. The CAP will also help achieve multiple community goals such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life. Specifically this CAP is designed to:

- Benchmark San Marcos' 2005 baseline GHG emissions and 2020 and 2030 projected emissions relative to statewide emissions goals.
- Establish GHG emissions targets for the years 2020 and 2030 consistent with statewide goals identified in Assembly Bill (AB) 32 and Executive Order S-3-05, which if met would result in a sustainable decrease in GHG emissions.
- Provide a detailed roadmap for achieving the city's GHG emissions reduction targets and help San Marcos prepare for anticipated climate change impacts.
- Fulfill City of San Marcos General Plan (2012) Policy COS-4.4 and Implementation Program COS-4.2, which direct the City to prepare this CAP.
- Serve as a comprehensive plan for addressing the cumulative impacts of GHG emissions within San Marcos (see California Environmental Quality Act

[CEQA] Guidelines, Sections 15064(h)(3), 15130(c), and 15183.5).

• Serve as the programmatic tiering document for the purposes of CEQA within the City of San Marcos for GHG emissions, by which applicable projects will be reviewed. If a proposed development project can demonstrate it is consistent with the applicable climate action measures included in the CAP, the programs and standards that would be implemented as a result of the CAP, and the General Plan growth projections, the project's environmental review pertaining to GHG impacts may be streamlined as allowed by CEQA Guidelines Sections 15152 and 15183.5.

# San Marcos' GHG Emissions

The City of San Marcos Greenhouse Gas Emissions Inventory Update (GHG Emissions Inventory) (2013) was prepared to identify the major sources and quantities of GHG emissions produced in San Marcos in 2005 and forecast how these emissions may change over time. The GHG Emissions Inventory provides information on the scale of emissions from various sources and where the opportunities to reduce emissions lie. It also provides a baseline against which the City can measure its progress in reducing GHG emissions.

According to the inventory, in 2005, the San Marcos community-as-a-whole emitted approximately 411,939 metric tons of carbon dioxide equivalent GHG emissions (MT  $CO_2e$ ), as a result of activities that took place within the transportation, residential energy use, commercial and industrial energy use, off-road, solid waste, water and wastewater sectors. As shown in Figure ES-1, the largest contributors of GHG emissions were the transportation (35 percent), commercial/industrial energy use (25 percent), and residential energy use (20 percent) sectors. The remainder of emissions resulted from the off-road (10 percent), solid waste (5 percent), water (3 percent) and wastewater (2 percent) sectors.

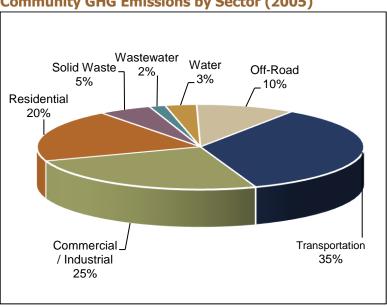
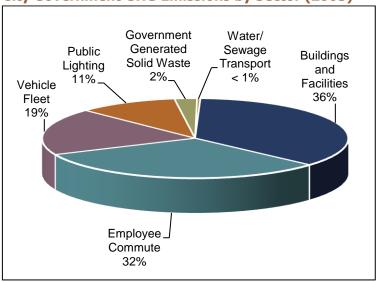


Figure ES-1
Community GHG Emissions by Sector (2005)

The GHG Emissions Inventory also analyzed emissions from City government operations and facilities. The City government inventory is a subset of the community inventory, meaning that the local government's GHG emissions are included within the community inventory. In 2005, City government operations generated approximately 5,120 MT CO<sub>2</sub>e. This quantity represents approximately one percent of the San Marcos community's total GHG emissions. As shown in Figure ES-2, the majority of these GHG emissions resulted from the City's building and facility energy use (36 percent), employee commute (32 percent), vehicle fleet (19 percent), and public lighting (street lights, traffic signal lights, and other outdoor public lighting) (11 percent).

Figure ES-2
City Government GHG Emissions by Sector (2005)



The GHG emission forecast is a projection of how emissions will change in the future based on the projected growth that would be accommodated by the General Plan. The "business-as-usual scenario" provides a forecast of how GHG emissions would change in the years 2020 and 2030 if consumption trends and efficiencies continue as they did in 2005, absent any new federal, state, regional, or local policies or actions that would reduce emissions. The year 2020 was selected to maintain consistency with the AB 32 target year and the year 2030 was selected to maintain consistency with the General Plan horizon year.

Under the business-as-usual scenario, San Marcos' GHG emissions are projected to grow approximately 27 percent above 2005 GHG emissions levels by the year 2020, from 411,939 MT  $CO_2e$  to 523,733 MT  $CO_2e$ , and by approximately 50 percent by the year 2030 (411,939 to 617,172 MT  $CO_2e$ ). Figure ES-3 shows the forecast results of the business-as-usual scenario.

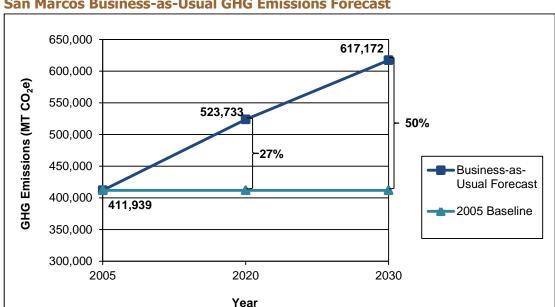


Figure ES-3
San Marcos Business-as-Usual GHG Emissions Forecast

The AB 32 Climate Change Scoping Plan (AB 32 Scoping Plan) (2008), prepared by the California Air Resources Board (CARB) pursuant to AB 32, identifies several State measures that are approved, programmed, and/or adopted and would reduce GHG emissions within San Marcos. These State measures require no additional local action. Therefore, these measures were incorporated into the forecast and reduction assessment to create an "adjusted scenario" which provides a more accurate picture of future emissions growth and the responsibility of the City once State measures to reduce GHG emissions have been implemented.

Under the adjusted scenario, GHG emissions are projected to decrease approximately 22 percent below the business-as-usual scenario to 409,108 MT  $CO_2e$  in 2020 and 28 percent below the business-as-usual scenario to 445,290 MT  $CO_2e$  in 2030. Table ES-1 summarizes the reduction in local GHG emissions that would result from State measures compared to the business-as-usual forecast and the adjusted forecast.

**Table ES-1 Summary of State Reductions and Adjusted Forecast** 

	2020 Reduction (MT CO <sub>2</sub> e)	2030 Reduction (MT CO <sub>2</sub> e)
Business-as-Usual Forecast	523,733	617,172
Reduction from State Measures	-114,625	-171,882
Adjusted Forecast	409,108	445,290

# **GHG Emissions Reduction Targets**

The City of San Marcos is committed to reducing its GHG emissions by 15 percent below 2005 levels by 2020, consistent with AB 32, and 28 percent below 2005 levels by 2030, working towards the long-term goal of Executive Order S-3-05. Based on these targets, San Marcos's 2020 targeted GHG emissions would be 350,148 MT  $CO_2e$  and its 2030 targeted GHG emissions would be 296,596 MT  $CO_2e$ . To meet these targets, San Marcos will need to reduce its GHG emissions 14 percent (or 58,960 MT  $CO_2e$ ) below the adjusted forecast by 2020 and 33 percent (or 148,694 MT  $CO_2e$ ) below the adjusted forecast by 2030 through implementation of local measures and actions (see Figure ES-4 and Table ES-2).

Figure ES-4
San Marcos' GHG Emissions, Targets, and Reduction Necessary to Meet Targets

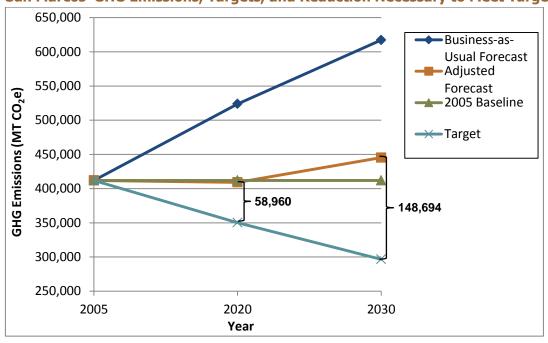


Table ES-2
San Marcos' GHG Emissions, Targets, and Reduction Necessary to Meet Targets

	2020 GHG Emissions (MT CO₂e)	2030 GHG Emissions (MT CO₂e)
2005 Baseline Emissions	411,939	411,939
Adjusted Forecast	409,108	445,290
Target	350,148	296,596
Total Reduction from Adjusted Forecast Necessary to Meet Target	58,960	148,694

# Climate Action Measures

To achieve the GHG emissions reduction targets of 15 percent below 2005 levels by 2020 and 28 percent below 2005 levels by 2030 and prepare for the anticipated effects of climate change, the CAP identifies a comprehensive set climate action measures. These measures are organized into the following focus areas, or categories: Local Government Operations, Energy, Transportation and Land Use, Off-Road Equipment, Water and Wastewater, Solid Waste, Urban Greening, Community Education and Outreach, and Adaptation. The measures were selected based on careful consideration of the emissions reductions needed to achieve the target, the distribution of emissions revealed in the GHG Emissions Inventory, goals and policies identified in General Plan, existing and ongoing efforts and priorities, policies and strategies of neighboring jurisdictions and regional agencies, and the potential costs and benefits of each measure. Collectively, the measures identified in the CAP have the potential to reduce GHG emissions within San Marcos by 64,876 MT CO<sub>2</sub>e by 2020 and 148,731 MT CO<sub>2</sub>e by 2030. This would bring 2020 emissions to 344,232 MT CO<sub>2</sub>e (equivalent to 16 below 2005 levels) and 2030 emissions to 296,559 MT CO<sub>2</sub>e (equivalent to 28 percent below 2005 levels), which meets and slightly exceeds the necessary reductions required to meet the targets.

# Implementation and Monitoring

Implementation and monitoring are essential processes to ensure that San Marcos reduces its GHG emissions and meets its targets. To facilitate this, each climate action measure is identified along with implementation actions, parties responsible for implementation and monitoring, cost and savings estimates, the GHG reduction potential (as applicable), performance indicators to monitor progress, and an implementation time frame. Measure implementation is separated into three phases: near-term (by 2015), mid-term (2016-2019), and long-term (2020-2030).

In order to ensure that measures are implemented and their progress is monitored, upon adoption of the CAP, the City will establish a CAP Coordinator who will provide essential CAP oversight and coordination of a multi-departmental CAP Implementation Team comprised of key staff in each selected department. The CAP Implementation Team will meet at least one time per year to assess the status of CAP efforts. The City's CAP Coordinator will be responsible for developing an annual progress report to the City Council that identifies the implementation status of each measure, evaluates achievement of or progress toward performance indicators (where applicable), assesses the effectiveness of various measures and actions included in the CAP, and recommends adjustments to measures or actions, as needed. An Excel-based implementation and monitoring tool will facilitate this process. To evaluate the performance of the CAP as a whole, the City will update the community and municipal GHG emissions inventories every five years, using the most up-to-date calculation methods, data, and tools.

# INTRODUCTION



Although climate change is a global issue, the State of California recognizes that it poses risks to the public health, environment, economic well-being, and natural resources of California, and has adopted legislations and policies to address climate change. In 2005, the governor issued Executive Order S-3-05 to reduce statewide GHG emissions to 1990 levels by 2020 (approximately 15 percent below 2005 to 2008 levels) and to 80 percent below 1990 levels by 2050. Enactment of several related pieces of climate action legislation followed. These include AB 32 (the Global Warming Solutions Act of 2006), which codified the 2020 target, and SB 97 (the CEQA and GHG Emissions bill of 2007), which requires lead agencies to analyze GHG emissions and mitigate climate change impacts under CEQA. These laws together create a framework for GHG emissions reductions and identify local governments as having a vital role in assisting the State in meeting these mandates. The AB 32 Scoping Plan, prepared by CARB pursuant to AB 32, notes that local governments have broad influence and, in some cases, exclusive authority over activities that result in GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. In recognition of the important role that local governments will play in the successful implementation of AB 32, the AB 32 Scoping Plan recommends that local governments adopt a 2020 GHG emission reduction target of 15 percent below 2005 to 2008 levels to match the statewide reduction target and mitigate their impacts on climate change.

Recognizing the important role and responsibility that local governments have in reducing GHG emissions and

mitigating their potential climate change impacts, the San Marcos General Plan directs the City to prepare this CAP. This chapter describes the purpose, scope, and content of San Marcos' CAP. It also discusses the relationship of the CAP to the General Plan and associated Environmental Impact Report (EIR). In addition, this chapter summarizes the scientific and regulatory framework under which this plan has been developed.

# 1.1 Purpose and Scope

This CAP is a long-range plan to reduce GHG emissions from community activities and City government operations within San Marcos in order to support the State's efforts under Executive Order S-3-05 and AB 32 and to mitigate climate-related impacts.

In 2012, the City of San Marcos completed a comprehensive update to its General Plan, which includes a number of goals, policies, and implementation programs that will reduce GHG emissions from both City operations and the community as a whole. General Plan Policy COS-4.4 and Implementation Program COS-4.2 specifically require the City to develop and implement this plan for reducing GHG emissions. This CAP fulfills the requirements of this policy and implementation program.

Specifically, the CAP does the following:

- Summarizes the results of the City of San Marcos GHG Emissions Inventory Update, which identifies the major sources and quantities of GHG emissions produced within San Marcos and forecasts how these emissions may change over time.
- Identifies the quantity of GHG emissions that San Marcos will need to reduce to meet the city's targets 15 percent below 2005 levels by the year 2020 and 28 percent below 2005 levels by 2030, consistent with AB 32 and working toward the long-term goal identified in Executive Order S-3-05.
- Sets forth City government and community GHG reduction measures, including performance standards which, if implemented, would collectively achieve the specified emissions reduction targets.

- Identifies proactive strategies that can be implemented to help San Marcos prepare for anticipated climate change impacts.
- Sets forth procedures to implement, monitor, and verify the effectiveness of the CAP measures and adapt efforts moving forward.

In addition to reducing San Marcos' GHG emissions consistent with statewide goals and mitigating the community's contribution to global climate change, implementation of the CAP will help achieve multiple community goals, such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life. The CAP may also be utilized to tier and streamline the analysis of GHG emissions of future development within San Marcos pursuant to State CEQA Guidelines 15152, 15183 and 15183.5 (refer to Section 1.5, Relationship to CEQA, and the CAP consistency worksheet and project-level GHG thresholds in Appendix E).

#### 1.2 Content

The CAP is organized into the following chapters:

- **1.0 Introduction** describes the purpose, scope, and content of San Marcos' CAP. It also discusses the relationship of the CAP to the General Plan and CEQA. In addition, this chapter summarizes the scientific and regulatory framework under which this plan has been developed.
- **2.0 Greenhouse Gas Emissions and Reduction Target** identifies the sources of GHG emissions in San Marcos, quantifies emissions for a baseline year (2005), and forecasts how GHG emission levels would change through 2030. This chapter also identifies and quantifies GHG emissions reduction targets for the years 2020 and 2030.
- **3.0 Climate Action Measures** organizes the CAP measures into the following focus areas: Local Government Operations, Energy, Transportation and Land Use, Off-Road Equipment, Water and Wastewater, Solid Waste, Urban Greening, Community Education and Outreach, and Adaptation. Each GHG reduction measure is presented with

existing and/or recently completed efforts in support of the measure, implementation actions, estimated GHG reductions in 2020 and 2030, and estimated costs and future savings.

**4.0 Implementation and Monitoring** – sets forth procedures to implement and monitor the individual climate action measures, evaluate the CAP's overall performance, and amend the plan if it is not achieving targeted reduction levels. It also identifies potential sources of funding to implement the CAP.

# 1.3 Planning Process

Development of the CAP largely drew on the extensive public outreach and input provided for the General Plan update. City staff and its consultants also worked representatives from various departments within the City to develop additional measures and implementation actions identified in the CAP and held one public workshop to gathered public input on the draft CAP. In addition, there was a webpage on the City's website dedicated to the CAP and e-mail announcements were sent to community members that signed up for the e-news email list. Regular updates were provided to the City Council throughout the course of the project to keep them apprised of the CAP's progress.

# 1.4 Relationship to General Plan

The General Plan, adopted in 2012, expresses the community's vision for the future in San Marcos and provides a basis for decision-making for land use and development actions. It consists of an organized set of goals, policies, and implementation programs that guide both the distribution of land uses and the way land is used. In regards to climate change, the Conservation and Open Space Element of the General Plan identifies Goal COS-4, to improve regional air quality and reduce GHG emissions that contribute to climate change. To achieve this goal, Policy COS-4.4 directs the City to implement measures to reduce GHG emissions, and includes the following language:

Quantify community-wide and municipal GHG emissions, set a reduction goal, identify and implement measures to reduce GHG emissions as required to by governing legislation.

The Implementation Plan for the General Plan specifically calls for development of a CAP. Implementation Program COS-4.2 reads:

Develop a Climate Action Plan for reducing GHG emissions to meet state requirements. Components of the plan should include:

- Quantify GHG emissions, both existing and projected, over a specified time period;
- Establish a level below which the contributions to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analysis the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify strategies and measures to be implemented at the project level that would collectively achieve the specified emission level;
- Establish a program for monitoring and reporting results.

In addition to fulfilling General Plan Policy COS-4.4 and Implementation Program COS-4.2, this CAP incorporates and/or builds on the numerous General Plan policies and implementation programs that would reduce San Marcos' GHG emissions. These policies and implementation programs are cross-referenced under each applicable CAP measure in Chapter 3 and detailed in Appendix D.

# 1.5 Relationship to CEQA

In order to analyze and reduce potentially significant GHG emissions resulting from development under the City of San Marcos General Plan, the City's approach was to develop a CAP that does the following:

 Quantifies GHG emissions for the base year 2005, as well as projected emissions for the years 2020 and 2030, resulting from activities within the City of San Marcos' jurisdictional boundary.

- Establishes GHG emissions targets for the years 2020 and 2030 that are consistent with the State of California's near-term emissions target identified in AB 32 and work toward the long-term target identified in Executive Order S-3-05.
- Identifies climate action measures in the areas of energy, transportation and land use, off-road equipment, water and wastewater, solid waste, urban greening, community education and outreach, and adaptation that will collectively achieve the City's GHG emissions targets and address potential climate change impacts.
- Sets forth procedures to monitor the City's progress towards its emissions targets and to allow for necessary CAP revisions if the plan is not achieving specified criteria and targets.
- Undergoes environmental review and gets adopted in a public process.

This approach is consistent with CEQA Guidelines Section 15183.5, which allows jurisdictions to analyze and mitigate the significant effects of GHG emissions at a programmatic level by adopting a plan for the reduction of GHG emissions. Once the CAP is adopted following environmental review, later projects that are consistent with the General Plan growth projections and land uses, upon which the GHG modeling is based, and the CAP measures and actions may tier from and/or incorporate the CAP by reference in their cumulative GHG impact analyses. Appendix E contains a worksheet that project applicants may use to demonstrate project-level compliance. If it is determined that a proposed project does not fall within the assumptions of the General Plan and/or is not consistent with the CAP, incorporating all applicable mandatory measures, further CEQA analysis would be required as detailed in Appendix E.

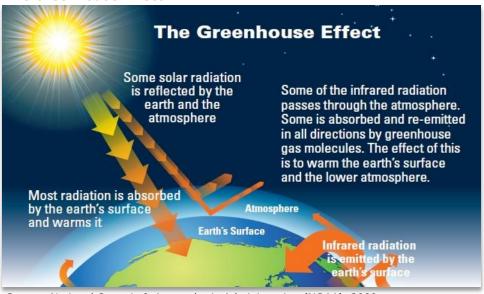
# 1.6 Scientific Background

In order to make meaningful and effective decisions regarding GHG reductions, it is important to understand the science under which this CAP has been developed. This section provides a brief introduction to the scientific research efforts to understand how climate change occurs and its implications.

# **Greenhouse Gases and Climate Change**

Global climate change refers to changes in the average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in average temperature of the Earth's surface and atmosphere caused by increased GHG emissions, which can contribute to changes in global climate patterns. GHGs, such as water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide  $(N_2O)$ , hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and ozone (O<sub>3</sub>), are gases in the Earth's atmosphere that play a critical role in determining the Earth's surface temperature. Specifically, GHGs allow high-frequency solar radiation to enter the Earth's atmosphere, but trap the low frequency, long wave energy, which is radiated back from the Earth to space, resulting in a warming of the atmosphere. The trapping of heat at the Earth's surface is known as the "greenhouse effect" (refer to Figure 1-1, the Greenhouse Effect).

Figure 1-1
The Greenhouse Effect



Source: National Oceanic & Atmospheric Administration (NOAA), 2009

GHGs are the result of both natural and human activities. The consumption of fossil fuels for power generation and transportation, forest fires, decomposition of organic waste, and industrial processes are the primary sources of GHG emissions. Without human intervention, the Earth maintains an approximate inter-annual balance between the emission of GHGs into the atmosphere and its storage in oceans and terrestrial ecosystems. Following the industrial revolution, however, increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) and other industrial processes have contributed to the rapid increase in atmospheric levels of GHGs (refer to Figure 1-2). This increase in GHGs correlates with the recent increase in global average temperature (which has risen approximately 1.4°F since the early 20th century) (NOAA, 2009).

Figure 1-2
Historic Fluctuations and Recent
Increase in Atmospheric Carbon Dioxide



This graph, based on the comparison of atmospheric samples contained in ice cores and more recent direct measurements, provides evidence that atmospheric  $CO_2$  has increased since the Industrial Revolution (NASA, 2013).

The principal GHGs that enter the atmosphere as a result of human activities are discussed below.

 Carbon dioxide (CO<sub>2</sub>) is released into the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., cement production) and deforestation. Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

- Methane (CH<sub>4</sub>) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from agricultural practices, such as the raising of livestock, and from the decomposition of organic waste in landfills.
- Nitrous oxide (N<sub>2</sub>O) is emitted during agricultural and industrial activities, as well as during the burning of fossil fuels and solid waste.
- Fluorinated gases (i.e., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) are synthetic GHGs that are emitted from a variety of industrial processes (e.g., aluminum production) and used in commercial, industrial, and consumer products (e.g., automobile air conditioners and refrigerants). These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as "high global warming potential" gases.

Each GHG has a different potential for trapping heat in the atmosphere, called global warming potential. For example, one pound of methane has 21 times more heat capturing potential than one pound of carbon dioxide. To simplify reporting and analysis of GHGs, GHG emissions are typically reported in metric tons of carbon dioxide equivalent (MT  $CO_2e$ ) units. When dealing with an array of emissions, the gases are converted to their carbon dioxide equivalents for comparison purposes. The global warming potentials for common GHGs are shown in Table 1-1.

Table 1-1
Global Warming Potential of GHGs

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	21
Nitrous Oxide (N <sub>2</sub> O)	310
Hydroflourocarbons (HFCs)	140 – 11,700
Perflourocarbons (PFCs)	6,500 – 9,200
Sulfur Hexaflouride (SF <sub>6</sub> )	23,900

Notes: Each of the GHGs listed above differs in its ability to absorb heat in the atmosphere, or in its global warming potential. The values presented above are based on the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report and United Nations Framework Convention on Climate Change guidelines.

# **Climate Change Impacts**

Increases in the globally averaged atmospheric concentration of GHGs will cause the lower atmosphere to warm, in turn inducing a myriad of changes to the global climate system. These large-scale changes will have unique and potentially severe impacts in the western United States, California, and the San Diego region. Current research efforts coordinated through CARB, California Energy Commission, California Environmental Protection Agency (EPA), University of California system, and other entities are examining the specific changes to California's climate that will occur as the Earth's surface warms.

#### Potential Implications for California

The best available climate models, according to the California Natural Resources Agency (2009), indicate that climate change could impact the natural environment in California in the following ways, among others:

- Extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent
- An increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality

- Rising sea levels along the California coastline, particularly in San Francisco Bay and the San Joaquin Delta caused by ocean expansion and glacier melt
- Reduced snow pack and stream flow in the Sierra Nevada Mountains, affecting winter recreation and water supplies
- Potential increase in the severity and historical pattern of winter storms, affecting peak stream flows and flooding
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield
- Changes in distribution of plant and wildlife species brought about by changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects

# Potential Implications for San Marcos

Rising temperatures affect local and global climate patterns, and these changes are forecasted to manifest themselves in a number of ways that may impact the San Diego region, including San Marcos. In 2008, a vulnerability assessment entitled the San Diego Regional Focus 2050 Study (Focus 2050) was prepared by the Scripps Institution of Oceanography, Science **Applications** International Corporation, and the Environmental and Sustainability Initiative at University of California, San Diego, and was published by the San Diego Foundation in 2008. Focus 2050 explored what the San Diego Region may look like in 2050 if current climate trends continue. The range of potential impacts presented in the Focus 2050 are based on projections of climate change on the San Diego region using three climate change models and two emissions scenarios drawn from those used by the IPCC.

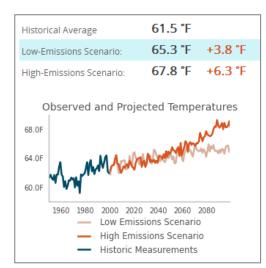
According to Focus 2050, average annual temperatures county-wide are projected to rise between 1.5°F and 4.5°F by 2050, with higher increases in summer. For San Marcos specifically, with its inland location, average annual

temperatures may rise between 3.8°F and 6.3°F by 2085. Rising temperatures, along with a growing population, will likely create a variety of challenges for the San Diego Region, including:

- Heat Waves More frequent, longer, and moreextreme heat waves, thereby increasing energy demand and bringing about public health threats in the process
- Air Quality Increased production of air pollutants, especially ozone, due to higher air temperatures, which can exacerbate respiratory and cardiovascular diseases
- Wildfires Increased wildfire frequency, intensity, and duration, thereby threatening public health and plant and animal species
- Water Supply Decreased water supply, more frequent drought conditions, and increased demand with implications for the community and environment
- Infectious Disease Increase risk of contracting infectious diseases from mosquitoes, ticks, and rodents, such as West Nile Virus and Hantavirus
- **Biodiversity and Habitats** Loss of plant and animal species, and their habitats
- Agriculture Decreased production for crops sensitive to temperature increases, decreased water supply, and increases in various pests
- **Energy Supply** More frequent power outages due to increased electricity demand

# 1.7 Regulatory Background

This section summarizes the federal, state, and regional legislation, regulations, policies, and plans that have guided the preparation and development of this CAP.



Projected changes in San Marcos' annual average temperature by 2085

Source: Cal-Adapt, 2013

#### **Federal**

**Clean Air Act.** The U.S. EPA is the federal agency responsible for implementing the Clean Air Act. In in Massachusetts et al. v. Environmental Protection Agency et al., issued on April 2, 2007, the U.S. Supreme Court ruled that carbon dioxide is an air pollutant as defined under the Clean Air Act and that the U.S. EPA has the authority to regulate emissions of GHGs as pollutants. In 2011, the U.S. EPA began regulating GHG emissions from new power plants and refineries through a set of New Source Performance Standards. These regulations will be finalized and applied to all new stationary sources in 2012.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes several provisions that will increase energy efficiency and the availability of renewable energy, which in turn will reduce GHG emissions. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy (CAFE) Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, it includes a variety of new standards for lighting and for residential and commercial appliance equipment, including residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

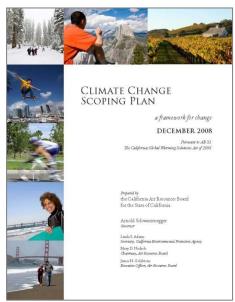
#### State of California

The State has been proactive in working to reduce emissions and has a long history of leadership in addressing energy and climate issues spanning the last 40 years. In 1988, AB 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission as the lead agency for climate change issues in California. Since that time, numerous initiatives in California have addressed climate change and energy efficiency, the majority of legislation passed between 2000 and now. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have also created targets and regulations that will directly lead to reductions in GHG emissions. These initiatives are described below.

**Executive Order S-3-05.** Executive Order S-3-05, issued in 2005, was the first comprehensive state policy to address climate change. It established ambitious GHG reduction targets for the State: reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. This Executive Order is binding only for State agencies and has no force of law for local governments. However, S-3-05 is important for two reasons. First, it obligates State agencies to implement GHG emission reduction strategies. Second, the signing of the Order sent a clear signal to the Legislature about the framework and content for legislation to reduce GHG emissions as a necessary step toward climate stabilization.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). AB 32 codified the State's 2020 GHG emissions target by directing CARB to reduce California's statewide emissions to 1990 levels by 2020. AB 32 also required CARB to develop a policy plan for reaching the 2020 emissions target and to adopt and enforce regulations to implement the plan. CARB adopted the resulting AB 32 Scoping Plan in December 2008. Key elements of the plan for achieving the 2020 target include:

- Adopting and implementing measures pursuant to existing state laws and policies, including California's goods movement measures and the Low Carbon Fuel Standard
- Expanding energy efficiency programs and green building practices
- Reducing methane emissions at landfills
- Developing a California cap-and-trade program
- Establishing and seeking to achieve reduction targets for transportation-related GHG emissions
- Increasing waste diversion, composting, and commercial recycling toward zero-waste
- Strengthening water efficiency programs
- Preserving forests that sequester carbon dioxide



The Climate Change Scoping Plan sets forth California's strategy to meet the GHG reduction target identified in AB 32. (CARB, 2008)

Although the AB 32 Scoping Plan does not identify specific reduction targets for local governments, it identifies overall reductions from local government operations and land use decisions as a strategy to meet the 2020 target. The AB 32 Scoping Plan states that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. It further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. However, the AB 32 Scoping Plan stopped short of identifying mandatory targets for local government compliance. Instead, it encourages local governments to adopt a target for municipal and community emissions that parallels the State's AB 32 target and to reduce emissions by approximately 15 percent from current levels by 2020.

**Senate Bill 97.** SB 97 (2007) established that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis and required the Governor's Office of Planning and Research to develop guidelines to analyze GHG impacts under CEQA. The guidelines were adopted on December 31, 2009, requiring lead agencies to analyze GHG emissions and the effects of GHG emissions under section 15064.4 during CEQA review.

**Senate Bill 375.** SB 375 (2008) supports implementation of AB 32 by aligning regional transportation planning efforts with land use and housing allocations in order to reduce transportation-related GHG emissions. Specifically, SB 375 directed CARB to set regional GHG emissions targets for passenger vehicles and light trucks for the years 2020 and 2035 for each Metropolitan Planning Organization (MPO) region, which were adopted in February 2011. For the San Diego Association of Governments (SANDAG), San Marcos' MPO region, CARB issued a 7 percent per capita reduction target from 2005 levels by 2020 and a 13 percent per capita reduction target by 2035. These targets apply to the SANDAG region as a whole, and not to individual cities or subregions. In 2005, GHG emissions from passenger vehicles in the San Diego region were approximately 26.0

tons  $CO_2e$  per capita. Therefore, SANDAG must reduce emissions to 24.2 tons  $CO_2e$  per capita or lower by 2020 and 22.6 tons  $CO_2e$  per capita or lower by 2035 in order to meet the target. SANDAG's 2050 Regional Transportation Plan and Sustainable Communities Strategy, adopted in 2011, detail how the region will meet the target (refer to the discussion of SANDAG's 2050 Regional Transportation Plan and Sustainable Communities Strategy below).

# Regional

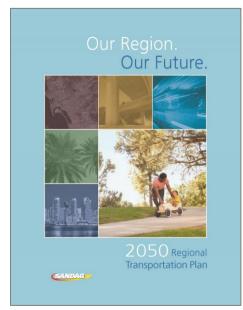
# San Diego Air Pollution Control District

The San Diego Air Pollution Control District (SDAPCD) has primary responsibility for the development implementation of rules and regulations designed to attain the National Ambient Air Quality Standards and California Ambient Air Quality Standards, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations within San Diego County, which is contiguous with the San Diego Air Basin. The SDAPCD regulates most air pollutant sources, except for mobile sources, which are regulated by CARB or the California EPA. State and local government projects, as well as projects proposed by the private sector, are subject to SDAPCD requirements if the sources are regulated by the SDAPCD.

The AB 32 Scoping Plan does not provide an explicit role for local air districts in implementing AB 32, but it does state that CARB will work actively with air districts in coordinating emissions reporting, encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting as well as through their role as CEQA lead or commenting agency, the establishment of CEQA thresholds, and the development of analytical requirements for CEQA documents. To date, the SDAPCD has not adopted any specific rules related to GHGs or developed specific thresholds of significance with regards to addressing the GHG emissions in CEQA documents.



San Diego Regional Comprehensive Plan Smart Growth Concept Map (SANDAG, 2012)



2050 Regional Transportation Plan (SANDAG, 2011)

#### San Diego Association of Governments

SANDAG is the local Council of Governments and MPO with responsibility for regional planning for San Diego County. SANDAG's planning efforts address regional issues relating to transportation, land use and urban form, housing, environment, economic development, regional public facilities, and climate change. Plans and programs that SANDAG has adopted that support GHG emissions reductions in San Marcos are described below.

**Regional Comprehensive Plan.** The Regional Comprehensive Plan, last updated in 2004, serves as the long-term planning framework for the San Diego region. It sets forth a regional strategy for smart growth and sustainable development in the San Diego region.

Smart Growth Concept Map. The Smart Growth Concept Map is a key component to implementing the Regional Comprehensive Plan, as it identifies locations within the region that can support smart growth and transportation investments. It served as the foundation for refining the regional transit network and identifying other transportation needs in the development of the 2050 Regional Transportation Plan. It also serves to determine eligibility to participate in the Smart Growth Incentive Program funded through TransNet. The Smart Growth Concept Map contains almost 200 existing, planned, or potential smart growth locations, including five within San Marcos.

2050 Regional Transportation Plan and Sustainable **Communities Strategy.** The Regional Transportation Plan, most recently updated in 2011, serves as the primary transportation element of the Regional Comprehensive Plan, and helps position the region to achieve smarter, more sustainable growth that meets the transportation needs of the growing population and changing region. The Regional Comprehensive Plan calls upon SANDAG to update the regional transportation plan and related programming documents in a way that both maximizes opportunities for local governments to implement smart growth and ensures design and implementation of regional that the transportation facilities support local smart growth. The 2050 Regional Transportation Plan lays out a plan for investing an estimated \$214 billion in local, state, and federal transportation funds expected to come into the region over the next 40 years.

Along with the 2050 Regional Transportation Plan, SANDAG adopted the Sustainable Communities Strategy. The Sustainable Communities Strategy details how the region will reduce GHG emissions from passenger vehicles and light trucks by 14 percent below 2005 levels by 2020 and 13 percent below 2005 levels by 2035 to State-mandated levels, pursuant to SB 375 (refer to the discussion of SB 375 in Section 1.7 above).

**Regional Energy Strategy.** The 2009 Regional Energy Strategy builds on and revises the Regional Energy Strategy adopted in 2003. It serves as an energy policy guide to support decision-making by SANDAG and its member agencies as the region strives to meet the energy needs of a growing population, housing stock, and number of workers while maintaining and enhancing regional quality of life and economic stability.

Climate Action Strategy. The SANDAG Climate Action Strategy (2010) serves as a guide to help policymakers address climate change as they make decisions to meet the needs of the region's growing population, maintain and enhance the quality of life of San Diego County residents, and promote economic stability. It does so in the context of the significant action on climate change happening in California, and the need for national and international attention to address what is ultimately a global issue.

#### **Local Government Roles and Responsibilities**

The AB 32 Scoping Plan establishes a framework for achieving statewide GHG reductions required by AB 32. Specifically, the Scoping Plan describes a list of measures that the State will undertake, and the anticipated GHG reductions associated by these measures by 2020. Because the State does not have jurisdictional control over all of the activities that produce GHG emissions in California, the AB 32 Scoping Plan articulates a unique role for local governments by identifying them as essential partners in achieving the state's GHG reduction goals. The Scoping Plan states that local governments "have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions

through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations". In addition, many of the Scoping Plan's proposed measures to reduce GHG emissions rely on local government actions. Based on this role, the AB 32 Scoping Plan recommends that local governments reduce GHG emissions from both their municipal operations and community at large by 15 percent from current levels by 2020 to parallel the State's target.





A GHG emissions inventory identifies the major sources and quantities of GHG emissions produced by community activities and City government facilities and operations within a jurisdiction's boundaries for a given year. Estimating GHG emissions enables local governments to establish an emissions baseline, track emissions trends, identify the greatest sources of GHG emissions within their jurisdiction, set targets for future reductions, and create an informed mitigation strategy based on this information.

This chapter summarizes the results of the City of San Marcos Greenhouse Gas Emissions Inventory Update (GHG Emissions Inventory) (refer to Appendix A for the complete report and supporting documentation). The GHG Emissions Inventory includes a 2005 baseline inventory of GHG emissions resulting from City government facilities and operations and community-wide activities within San Marcos. It also includes a 2020 and 2030 business-as-usual forecast of how emissions in San Marcos would change if no further actions are implemented to reduce those emissions, and a 2020 and 2030 adjusted forecast to account for the impact of several State regulations that have been established since the 2005 baseline year that will reduce local emissions. In addition, this chapter identifies San Marcos' GHG emissions reduction targets for the years 2020 and 2030.

#### 2.1 2005 Baseline Emissions

This section describes the methodology used to complete the 2005 baseline inventory of emissions from City government operations and community activities, and summarizes the results.

#### Methodology

The baseline inventory calculates GHG emissions that occurred within the City's jurisdictional boundary in the year 2005. It includes a City government inventory that identifies the sources and quantities of emissions resulting from the City of San Marcos' operations and facilities, and a community inventory that details the sources and quantities of GHG emissions resulting from activities from the San Marcos community as a whole. The City government inventory is a subset of the community inventory, meaning that the City government's emissions are included within the community inventory.

The community inventory is divided into seven sectors, or sources of emissions: on-road transportation, residential energy use, commercial and industrial energy use, solid waste, water, wastewater, and off-road equipment. The City government inventory provides a more detailed analysis of emissions resulting from City-owned or -operated buildings, fleet vehicles, and lighting; water and sewage transport; City-generated solid waste; and employee commute travel.

The City government operations inventory follows the Local Government Operations Protocol (version 1.1), which was adopted in 2010 by CARB and serves as the national standard for quantifying and reporting GHG emissions from local government operations. The community inventory was developed consistent with the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (2012). These protocols provide standard accounting boundaries, quantification methods, principles, procedures for reporting GHG emissions. Like all emissions inventories, the inventory must rely on the best-available data and calculation methodologies, and, therefore, represents a best estimate of GHG emissions following standard protocol. As protocols are updated and better data and calculation methodologies become available, the inventory can be updated and improved. Nevertheless, the findings of this analysis provide a solid basis upon which San Marcos can begin planning and taking action to reduce its GHG emissions. A detailed description of these

methodologies, as well as their limitations, is provided in the GHG Emissions Inventory, located in Appendix A.

#### **City Government Emissions**

In 2005, City government facilities and operations generated approximately 5,120 MT CO<sub>2</sub>e (metric tons of carbon dioxide equivalent emissions). This quantity represents approximately one percent of San Marcos' total community-wide GHG emissions. As shown in Figure 2-1 and Table 2-1, electricity and natural gas used in City buildings and facilities and fuel use from employee commutes were the largest contributors to the City's emissions (approximately 36 percent and 32 percent of emissions, respectively). Emissions from the City's vehicle fleet were also a significant source of emissions (19 percent), as were emissions from electricity used for public lighting (11 percent). Emissions from City governmentgenerated solid waste (2 percent) and electricity used to transport water and sewage (1 percent) accounted for the remainder of the City's emissions.

Figure 2-1
City Government GHG Emissions by Sector (2005)

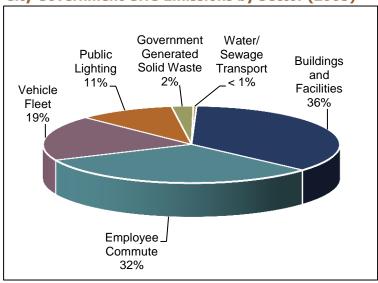


Table 2-1
City Government GHG Emissions by Sector (2005)

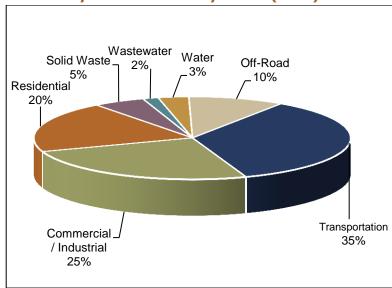
Sector	Description	GHG Emissions (MT CO₂e)	Percent of Total
Buildings and Facilities	Electricity, natural gas, and diesel fuel use in City-owned or - operated buildings and facilities	1,847	36%
Employee Commute	Fuel consumption for City employee commutes	1,619	32%
Vehicle Fleet	Fuel consumption and mobile refrigerants for City fleet vehicles and off-road vehicles/equipment		19%
Public Lighting	Electricity used to power streetlights, traffic signal lights, and other public outdoor lighting	540	11%
Government-Generated Solid Waste	Landfilled solid waste generated by City operations	121	2%
Water/Sewage Transport	Electricity used for water and sewage transport resulting from City operations	18	<1%
TOTAL		5,120	100%

#### **Community Emissions**

In 2005, the San Marcos community emitted approximately 411,939 MT CO<sub>2</sub>e, as a result of activities that took place within the transportation, residential energy commercial and industrial energy use, solid waste, water, wastewater, and off-road sectors. As shown in Figure 2-2 and Table 2-2, the on-road transportation sector was the contributor of GHG emissions, generating approximately 144,517 MT CO<sub>2</sub>e, or 35 percent of total 2005 emissions. Transportation sector emissions are the result of fuel used in vehicles whose trips begin and/or end within the city limits. This accounts for trips entering or exiting San Marcos and travel within the city, but excludes pass-through trips that do not originate or end in San Marcos. Electricity and natural gas consumption within the commercial and industrial sector was the second largest contributor, generating 103,192 MT CO<sub>2</sub>e, or 25 percent of the total emissions. Electricity and natural gas consumption in San Marcos' residential sector produced 82,754 MT CO<sub>2</sub>e, or 20 percent of total community emissions. The remainder of emissions resulted from solid waste sent to landfills (21,714 MT CO₂e, or 5 percent), fuel used in off-road vehicles and equipment (40,437 MT CO<sub>2</sub>e, or 10 percent),

water (12,757 or 3 percent), and wastewater (2 percent, or 6,568 MT CO<sub>2</sub>e).

Figure 2-2 **Community GHG Emissions by Sector (2005)** 



**Table 2-2 Community GHG Emissions by Sector (2005)** 

Sector	Description	GHG Emissions (MT CO₂e)	Percent of Total
On-Road Transportation	Fuel consumption for on-road vehicles (cars, trucks, etc.)	144,517	35%
Commercial/Industrial	Electricity and natural gas used in commercial and industrial buildings	103,192	25%
Residential	Electricity and natural gas used in residences	82,754	20%
Solid Waste	Solid waste generated and sent to landfills	21,714	5%
Wastewater	Treatment of wastewater and electricity used to convey and treat wastewater	6,568	2%
Water	Electricity used to convey and treat water	12,757	3%
Off-Road	Fuel consumption for off-road equipment (construction, lawn and garden, etc.)	40,437	10%
TOTAL		411,939	100%

#### 2.2 2020 and 2030 Forecasts

#### **Methodology**

The GHG emissions forecast provides a "business-as-usual estimate," or scenario, of how emissions will change in the years 2020 and 2030 if consumption trends and efficiency continue as they did in 2005, absent any new federal, state, regional, or local policies or actions that would reduce emissions. The year 2020 was selected for the forecast in order to maintain consistency with AB 32. The year 2030 was selected for the forecast in order to be consistent with horizon year of the City of San Marcos General Plan.

The GHG emission forecast is based on projected growth trends in population, employment, households, and vehicle miles traveled. The forecast relies on the City's General Plan Final Environmental Impact Report (February 2012) for population and job projections and the SANDAG 2050 San Diego Regional Travel Demand Model for the vehicle miles traveled projections. The forecast is based on the assumption that the number of drivers, electricity and natural gas consumption, solid waste tonnage, water usage, and wastewater generation will increase over time in proportion to population, jobs, and vehicle miles traveled. Table 2-3 shows the growth projections used to determine the community emissions growth for each sector in 2020 and 2030.

**Table 2-3 San Marcos' Growth Projections** 

Growth Indicator	2005	2020	2030	Sector Applied to
Population	72,911	101,238	121,447	Residential, Solid Waste, Water, Wastewater
Jobs	37,709	48,241	60,272	Commercial/Industrial, Off-Road
Average Daily Vehicle Miles Traveled	802,136	939,717	1,044,311	On-Road Transportation

Note: Values in table are totals for each year (e.g., 101,238 is the total population in 2020, not the estimated growth from 2005 to 2020).

#### **Business-as-Usual Forecast**

Under the business-as-usual scenario, San Marcos' GHG emissions are projected to grow approximately 27 percent above 2005 GHG emissions levels by the year 2020, from 411,939 MT  $CO_2e$  to 523,733 MT  $CO_2e$ , and by approximately 50 percent by the year 2030 (411,939 to 617,172 MT  $CO_2e$ ). Figure 2-3 and Table 2-4 show the results of the forecast.



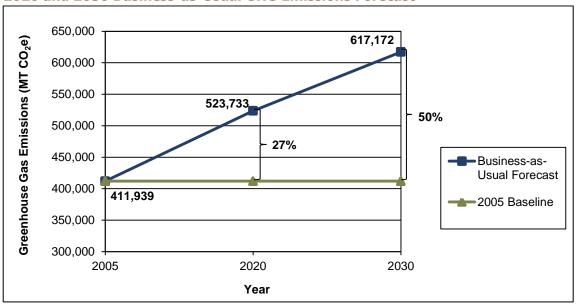


Table 2-4
2020 and 2030 Business-as-Usual GHG Emissions Forecast

Sector	2005 (MT CO₂e)	2020 (MT CO₂e)	2030 (MT CO₂e)
On-Road Transportation	144,517	171,539	191,685
Commercial/Industrial	103,192	132,014	164,936
Residential	82,754	114,904	137,842
Solid Waste	21,714	30,150	36,169
Wastewater	6,568	9,120	10,940
Water	12,757	17,713	21,249
Off-Road	40,437	48,293	54,351
TOTAL	411,939	523,733	617,172

#### **Adjusted Forecasts**

The AB 32 Scoping Plan identifies several State measures that have been approved, programmed, and/or adopted since the 2005 baseline year and would reduce GHG emissions within San Marcos. These State measures require no additional local action. Therefore, these measures were incorporated into the forecast and reduction assessment to create an "adjusted scenario," which provides a more accurate picture of future emissions growth and the responsibility of San Marcos once State measures to reduce GHG emissions have been implemented. A brief description of each of these measures is provided on the following page and the calculation details are located in Appendix B, Table B-2, of this document. Table 2-5 summarizes the reduction in local emissions that would result from State measures. Under the adjusted scenario, GHG emissions are projected to decrease approximately 22 percent below the businessas-usual scenario to 409,108 MT CO<sub>2</sub>e in 2020 and 28 percent below the business-as-usual scenario to 445,290 MT CO<sub>2</sub>e in 2030.

**Table 2-5 Summary of State Reductions and Adjusted Forecast** 

State Measure	2020 Reduction (MT CO₂e)	2030 Reduction (MT CO₂e)
Clean Car Standards, AB 1493 (Pavley I)	-26,040	-42,240
Advanced Clean Cars	-4,010	-24,061
Low Carbon Fuel Standard – On Road Transportation	-14,149	-12,538
Low Carbon Fuel Standard – Off-Road Vehicles	-4,829	-5,435
Title 24	-6,459	-16,712
Renewable Portfolio Standard	-55,108	-66,062
Water Conservation Act of 2009 – SB X7-7	-4,030	-4,834
<b>Total State Reduction</b>	-114,625	-171,882
Adjusted Forecast	409,108	445,290

#### Clean Car Standards, AB 1493 (Pavley I)

Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the CARB in 2004 and took effect in 2009 when the USEPA issued a waiver confirming California's right to implement the bill. CARB anticipates that the Pavley I standards will reduce GHG emissions from new California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, while simultaneously improving fuel efficiency and reducing motorists' costs.

#### **Advanced Clean Cars Standards**

The Advanced Clean Cars program (January 2012) coordinates the goals of the LEV, ZEV, and Clean Fuels Outlet programs combining the control of smog, soot causing pollutants and greenhouse gas emissions into a single coordinated package of requirements for model years 2017 through 2025. By 2020, CO₂e emissions would be reduced by 3 percent and by 2025 CO₂e emissions would be reduced approximately 12 percent from baseline levels. The reduction increases in 2035 to 27 percent reduction from baseline levels and even further in 2050 to 33 percent reduction.

#### **Low Carbon Fuel Standard (LCFS)**

The LCFS is a flexible performance standard designed to accelerate the availability and diversity of low-carbon fuels by taking into consideration the full life-cycle of GHG emissions. As part of the AB 32 Scoping Plan, the LCFS is expected to reduce the carbon intensity of gasoline and diesel fuels by 10 percent.

#### Renewable Portfolio Standard

Established in 2002 under SB 1078, and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard required investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they achieved 20 percent by 2010. SB 2X raises the target from the current 20 percent, requiring private and public utilities to obtain 33 percent of their electricity from renewable energy sources by 2020.

#### California Code of Regulations Title 24, Part 6

Although it was not originally intended specifically to reduce GHG emissions, California Code of Regulations Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption, which in turn reduces fossil fuel consumption and associated GHG emissions The California Energy Commission estimates that the 2008 standards reduce consumption by 10% for residential buildings and 5% for commercial buildings, relative to the previous standards. For projects implemented after January 1, 2014, the California Energy Commission estimates that the 2013 Title 24 energy efficiency standards will reduce consumption by 25% for residential buildings and 30% for commercial buildings, relative to the 2008 standards.

#### **Senate Bill X7-7 (Water Conservation Act of 2009)**

SB X7-7 (2009) requires all water suppliers to increase water use and sets an overall goal of reducing per capita urban water use by 20 percent by 2020.

### 2.3 GHG Emissions Reduction Targets

The City is committed to reducing San Marcos' GHG emissions consistent with AB 32 and working toward the target of Executive Order S-3-05. The AB 32 Scoping Plan encourages local governments to establish a reduction target that "parallels the State's commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020." Therefore, this CAP establishes a reduction target of 15 percent below 2005 levels by 2020 in conformance with the State's recommended reduction target. This CAP also establishes a longer-term target of 28 percent below 2005 levels by 2030, working toward the goals of Executive Order S-3-05.

The 2005 baseline GHG emissions inventory and 2020 and 2030 GHG emissions forecast under the adjusted scenario provide the necessary background for the City to identify the reduction in emissions needed from local measures to meet this target.

As shown in Table 2-6 and Figure 2-4, based on the reduction targets, San Marcos would need to reduce its community emissions to 350,148 MT  $CO_2e$  by 2020 and to 296,596 MT  $CO_2e$  by 2030. To meet these targets, San Marcos will need to reduce its GHG emissions 14 percent below the adjusted forecast levels (equivalent to 58,960 MT  $CO_2e$ ) by 2020 and 33 percent below the adjusted forecast levels (equivalent to 148,694 MT  $CO_2e$ ) by 2030 through implementation of local measures and actions.

Table 2-6
San Marcos' GHG Emissions, Targets, and Reduction Necessary to Meet Targets

	2020 GHG Emissions (MT CO₂e)	2030 GHG Emissions (MT CO <sub>2</sub> e)
2005 Baseline Emissions	411,939	411,939
Adjusted Forecast	409,108	445,290
Target	350,148	296,596
Total Reduction from Adjusted Forecast Necessary to Meet Target	58,960	148,694

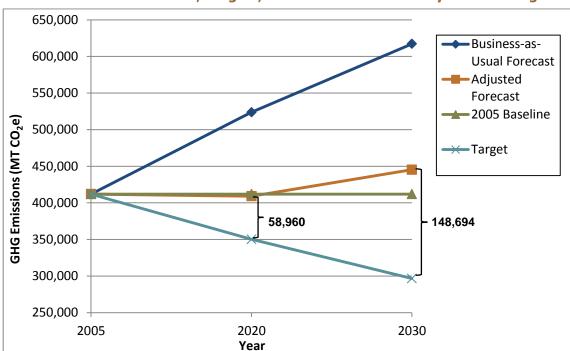


Figure 2-4
San Marcos' GHG Emissions, Targets, and Reduction Necessary to Meet Targets





The climate action measures, which represent ways to reduce GHG emissions or adapt to climate change, are organized into nine focus areas. These focus areas include:

- Local Government Operations
- Energy
- Transportation and Land Use
- Off-Road Equipment
- Water and Wastewater
- Solid Waste
- Urban Greening
- Community Education and Outreach
- Adaptation

Details related to measure implementation and monitoring, including responsible parties, performance criteria, implementation time frames, potential funding sources, etc. are located in Chapter 4.

This chapter identifies the measures that the City will implement to achieve the GHG emissions reduction targets of 15 percent below 2005 levels by 2020 and 28 percent below 2005 levels by 2030. These measures will also help the City prepare for the anticipated effects of climate change.

The City has identified a set of measures based on careful consideration of the reductions needed to achieve the target, the sources and distribution of emissions revealed in the GHG emissions inventory, existing priorities and resources, and the potential costs and benefits of each measure. The CAP measures and actions incorporate and/or build on many of the policies and implementation programs identified in the San Marcos General Plan, the mitigation measures identified in the General Plan EIR, and the regulations and standards set forth in the Municipal Code. They are also consistent with a number of other policy and guidance documents, including the San Marcos Energy Roadmap (2013), SANDAG Climate Action Strategy (2010), SANDAG Regional Energy Strategy (2009), SANDAG 2050 Regional Transportation Plan and Sustainable Communities Strategy (2011), and San Diego County Multi-jurisdictional Hazard Mitigation Plan (2010).

## 3.1 Chapter Organization

Each focus area begins with an introduction, followed by a summary table listing the measures within the focus area and the associated GHG reduction potential, where applicable. Following the introduction to each focus area, each measure is presented with the following information:

- Objective: the outcome necessary to achieve the measure's GHG emissions reduction potential (synonymous with performance criteria identified in Chapter 4 and Appendix B).
  - Existing and/or Completed Efforts: efforts the City
    has implemented, or is in the process of implementing,
    since the baseline year (2005) to accomplish the
    measure objective. General Plan policies and
    implementation programs and General Plan EIR
    mitigation measures cross-referenced this section are
    provided in Appendix D.
- **Implementation Actions:** the specific steps the City will take to achieve the measure objective.
- GHG Reduction Potential: the estimated reduction in emissions anticipated in 2020 and 2030. Supporting information pertaining to the GHG reduction calculations is provided in Appendix B.
- Costs and Savings: for each measure, potential costs and savings to the City or community (private) are categorized as none, low, medium, or high. Table 3-1 summarizes these category definitions. Costs account for the expense that would occur beyond conducting business-as-usual (i.e., without implementation of the CAP). Supporting information is provided in Appendix C.

Table 3-1
Measure Cost and Savings

City Cost/Savings		Private Cost/Savings	
None:	\$0	None:	\$0
Very Low:	\$1 - \$10,000	Very Low:	\$1 - \$1,000
Low:	\$10,001 - \$50,000	Low:	\$1,001 - \$5,000
Medium:	\$50,001 - \$100,000	Medium:	\$5,001 - \$10,000
High:	\$100,001 - \$200,000	High:	\$10,001 - \$20,000
Very High:	\$200,001 or greater	Very High:	\$20,001 or greater

#### **Co-Benefits of Local Government Measures**

In addition to reducing GHG emissions, the local government measures described in this section have the potential to provide other important benefits to the community. These benefits include:

- Municipal leadership
- Reduced operating costs
- Lower maintenance costs and extended equipment lives
- Improved public health
- Improved air and water quality
- Improved infrastructure
- Resource conservation
- City beautification

#### Local Government Measures 3.2

The City has already taken a number of steps that have resulted in GHG emissions reductions and is committed to building on those efforts by increasing energy efficiency and conservation in municipal buildings, increasing its use of renewable energy, purchasing more efficient fleet vehicles, expanding commute options for City employees, reducing solid waste, and planting trees. This focus area identifies measures and actions that the City can implement to further reduce GHG emissions from City government operations and facilities. Although the GHG emissions that result from local government operations and facilities account for only one percent of San Marcos' community-wide emissions, as an employer, property-owner, and regulatory entity, the City can set an example of GHG emissions reduction practices for the community and demonstrate additional benefits of the measures beyond reducing GHG emissions, such as cost savings in buildings and operations and improved operational efficiency. As shown in Table 3-2, local government measures have the potential to reduce San Marcos' GHG emissions by 788 MT CO<sub>2</sub>e by 2020 and 1,294 MT  $CO_2e$  by 2030.

#### **Local Government GHG Reductions by Measure**

Measure Number	Measure	2020 GHG Reduction (MT CO₂e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
LG-1	CAP Implementation	Supportive	Supportive
LG-2	Municipal Energy Efficiency and Conservation	239	477
LG-3	Solar Energy for City Buildings and Facilities	61	61
LG-4	Low Emission Fleet Vehicles	144	203
LG-5	Employee Commute Alternatives	243	405
LG-6	LG-6 Municipal Solid Waste Diversion LG-7 Tree Planting on City Property		42
LG-7			106
Local Gover	Local Government Operations Total		1,294

#### **LG-1: CAP Implementation**

Establish a City CAP Coordinator and multidepartmental CAP Implementation Team to implement, monitor, and report on the status of measures and actions identified in the CAP.

*Objective:* Establish a City CAP Coordinator and multidepartmental CAP Implementation Team.

Existing and/or Completed Efforts in Support of Measure:

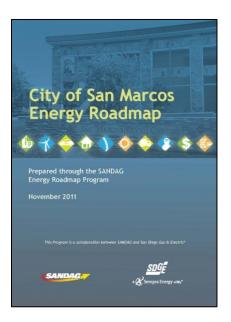
• The following General Plan policy and program supports implementation of this measure: Policy COS-4.4 and Program COS-4.2.

#### Implementation Actions.

- LG-1.1: Form a multi-departmental CAP Implementation Team that meets annually to implement, monitor, and report on the status of measures and actions identified in the CAP according to the implementation and monitoring chapter.
- LG-1.2: Designate a City staff member on the CAP Implementation Team to have lead responsibilities for implementing the CAP and monitoring progress. Duties of this position include coordinating the CAP Implementation Team, preparing the annual CAP progress report to the City Council, and coordinating the GHG emissions inventory and CAP updates as specified in the implementation and monitoring chapter.
- LG-1.3: Provide CAP implementation and GHG reduction training to City staff.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
Supportive	Supportive	Low	None	None	None

The City participates in the Energy Roadmap Program, a partnership between SANDAG and SDG&E that offers local iurisdictions assistance in making their buildings and processes energy efficient. Through this process, energy assessments, called "Energy Report Cards", and benchmarking were completed for 16 municipal buildings. In addition, comprehensive energy audits were completed for 12 buildings to identify opportunities for energy and cost savings. The San Marcos Energy Roadmap (2011), which is consistent with the SANDAG Regional Energy Strategy (2009), offers a comprehensive framework for saving energy at City government facilities.



#### **LG-2: Municipal Energy Efficiency and Conservation**

#### Reduce the amount of energy used at City buildings and facilities.

Objective: Reduce the amount of energy used at City buildings and facilities by 10 percent below 2005 levels by 2020 and 20 percent below 2005 levels by 2030.

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the City has replaced all 9,520 traffic signal lights, 1,040 pedestrian modules, 521 safety lights, 4 street lights, 335 pedestrian lights, 27 outdoor parking area lights and indoor lights at the Civic Center, and directory signs with light emitting diodes (LED). The City is currently in the process of converting all 500 remaining safety lights and all 2,200 remaining low pressure sodium street lights to LED, which is expected to be completed by 2015.
- Since 2005, the City has installed 12 occupancy sensors at municipal buildings.
- In 2010, the main chiller at City Hall was upgraded to include a high efficiency variable frequency drive. In 2012 and 2013, a chiller, two boilers, and two cooling towers were replaced with more energy efficient models. Variable frequency drives have been installed on the City fountains, reducing the energy consumption by 25 to 35 percent.
- Between 2005 and 2013, new heating ventilation and air conditioning (HVAC) equipment, pumps, and variable frequency drives were installed at the City Hall and Public Works sites. The HVAC equipment is maintained in accordance with the City's preventive maintenance program and to industry standards.
- Since 2008, peak load management and demand response programs have been implemented at Mission Sports Park.
- In 2012, the City installed a \$600,000 new central plant that is anticipated to reduce energy use at City Hall by 264,764 kWh. City Hall's energy use for calendar year 2013 is expected to be approximately 15 percent below its energy use in 2005, which is equivalent to a reduction of approximately 307,822 kWh per year.

- The majority of new City equipment is ENERGY STAR compliant.
- The City installed cool roofs at Fire Stations 3 and 4, City-owned residential units, and the gymnasium.
- Since 2005, the City has operated on a 9/80 work plan for the majority of City force occupied buildings.
- The following General Plan policies and programs support implementation of this measure: Policy LU-6.1, Program LU-2.1, Policy COS-4.6, Policy COS-4.7, Program COS-4.3, and Program COS-7.5.

#### Implementation Actions:

- LG-2.1: Develop and implement a schedule to address cost-effective municipal energy retrofit and improvement projects (e.g., appliance and equipment upgrades, reducing overall lighting or hours of operation, additional efficient lighting and lighting control systems, cool roofs, shade trees, retrocommissioning, items identified in the San Marcos Energy Roadmap, etc.).
- LG-2.2: Work with SDG&E to access technical assistance and financial incentives, such as facility audits, rebates, on-bill financing, loans, grants, and savings-by-design programs.
- LG-2.3: Participate in the SDG&E Emerging Technologies Program, as feasible, and use City facilities to showcase emerging energy efficient technologies.
- LG-2.4: Identify staff positions or employees that could benefit from energy-related workshops and trainings and require their participation in SDG&E, Center for Sustainable Energy, or other relevant workshops, seminars, or certification programs.

# What is SDG&E's Emerging Technologies Program?

The SDG&E Emerging
Technologies Program
identifies, evaluates and
demonstrates promising
advanced technologies that
can save energy and money
for customers while meeting
California's energy-efficiency
goals. This program actively
looks for sites to demonstrate
emerging technologies,
including local government
facilities (SDG&E, 2010).

#### What is Zero Net Energy?

Zero Net Energy means the amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building. A Zero Net Energy building may also consider embodied energy – the quantity of energy required to manufacture and supply to the point of use, the materials utilized for its building.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
239 MT CO <sub>2</sub> e	477 MT CO₂e	Very Low	Very High	None	None

The San Elijo Road Fire Station (Fire Station #4) includes a solar photovoltaic (PV) system that provides about 95 percent of the station's electrical needs. The station earned LEED Gold certification, the second-highest level of recognition under the Leadership in Energy and Environmental Design program (City of San Marcos, 2013).



#### **LG-3: Solar Energy for City Buildings and Facilities**

Continue to install on-site small-scale solar photovoltaic (PV) systems at municipal facilities.

*Objective:* Install 186 kW of solar PV systems by 2020. Please note the City has already met this objective.

Existing and/or Completed Efforts in Support of Measure:

- The City has installed approximately 186 kW of solar PV systems on Fire Stations 2 and 4.
- Between 2008 and 2012, the City installed 31 solar PV powered flashing beacons and radar speed feedback signs throughout the community.
- The following General Plan policies and General Plan EIR mitigation measure support implementation of this measure: Policy LU-6.1, Policy COS-4.7, Policy COS-4.8, and Mitigation Measure AG-4.

Implementation Actions:

LG-3.1: Identify and secure funding (e.g., through grants, on-bill financing, loans, energy performance contracts, lease-purchase agreements, or other mechanisms) to install additional solar PV systems at City properties and facilities.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings	
61 MT CO₂e	61 MT CO₂e	None	None	None	None	

#### **LG-4: Low Emissions Fleet Vehicles**

## Continue to increase overall City fleet fuel efficiency and the use of low carbon fuels.

Objective: Reduce GHG emissions associated with the City's vehicle and equipment fleet by 15 percent below 2005 levels by 2020 and 21 percent below 2005 levels by 2030 (about 4 vehicles replaced between 2006 and 2013 [complete], 2 vehicles replaced between 2014 and 2019, and 6 vehicles replaced between 2020 and 2030, for a total of 12 vehicles replaced between 2006 and 2030).

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the City has replaced four gasoline vehicles with three Ford Hybrid Escapes and one Toyota Prius, and reduced its heavy-duty vehicle and equipment fleet by removing one Road Grader, one D-4 Dozer, one Street Sweeper, and 12 light duty trucks.
- The following General Plan policy supports implementation of this measure: Policy LU-6.1.

#### Implementation Actions:

- LG-4.1: Develop a low- and zero-emissions replacement /purchasing policy for official City vehicles and equipment. This would not apply to vehicles with special performance requirements.
- LG-4.2: Identify and secure funding (e.g., through the San Diego Regional Clean Cities Coalition, CARB, California Energy Commission, and/or California Center for Sustainable Energy) to purchase lowand zero-emissions fleet vehicles and equipment.
- LG-4.3: Work with individual departments with vehicle fleets and equipment to develop fuel saving policies and programs (e.g., using fleet management software to monitor fleet use and performance, training in fuel-efficient driving, route logistics planning, etc.).

The City of San Marcos maintains a fleet of approximately 150 vehicles that range from sedans and pick-up trucks to fire engines and other heavy-duty trucks. The city can achieve transportation-related energy savings through actions that promote fuel conservation, efficiency, and an increased use of clean, alternative fuels in its vehicle fleet.

To increase overall fleet fuel efficiency, the Federal Energy Management Program recommends focusing on increasing fuel efficiency of the least efficient vehicles as a first step. Also, the U.S. Department of Energy's free Petroleum Reduction Planning Tool

(www.afdc.energy.gov/afdc/prep/) can help fleet managers evaluate and calculate petroleum reduction through the following methods:

- Alternative fuels
- Hybrid electric vehicles
- Biodiesel blends
- Fuel economy
- VMT reduction
- Truck stop electrification
- Idling time reduction
- · Onboard idle reduction

The fleet manager can set a petroleum reduction goal and the online tool will identify potential savings based on the fleet information entered and petroleum reduction measures selected (SANDAG. 2011).

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
144 MT CO <sub>2</sub> e	203 MT CO <sub>2</sub> e	Medium	Very Low	None	None

The City of San Marcos can achieve transportation-related energy savings and GHG reductions by promoting commuter programs to its employees. Such programs provide alternative transportation options to driving alone and incentives to use them.

The SANDAG iCommute Program provides free assistance to San Diego regional businesses in establishing and implementing customized employee commuter benefit programs that lower costs, increase productivity, and help the environment.



#### **LG-5: Employee Commute Alternatives**

Implement programs and provide incentives to reduce annual vehicle miles traveled associated with City employee commutes.

Objective: Reduce annual VMT associated with employee commutes by 15 percent below 2005 levels by 2020 and 25 percent below 2005 levels by 2030.

Existing and/or Completed Efforts in Support of Measure:

- Since 2006, the City has operated on a 9/80 work plan for all City force occupied buildings, reducing employee commute VMT by approximately 10 percent.
- The following General Plan program supports implementation of this measure: Program M-1.2.

#### Implementation Actions:

- Participate in SANDAG's free iCommute LG-5.1: program to develop and implement a customized commuter benefit program for City employees, including incentives, such as pretax benefits and/or discounted transit passes.
- LG-5.2: Establish an iCommute employer network to track the number of City employees participating in the program and measure the City's financial and environmental savings.
- LG-5.3: Work with iCommute to provide employee outreach.
- LG-5.4: Participate in and promote annual regional commute trip reduction events.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings	
243 MT CO <sub>2</sub> e	405 MT CO₂e	Very Low	None	None	Varies	

#### **LG-6: Municipal Solid Waste Diversion**

# Reduce the amount of landfilled solid waste generated at City facilities.

*Objective:* Reduce City-generated solid waste by 25 percent below 2005 levels by 2020 and by 35 percent below 2005 levels by 2030.

Existing and/or Completed Efforts in Support of Measure:

- Recycling receptacles are provided at the majority of City parks, and all new park and trail projects created since 2006.
- As of 2006, all parks and community services buildings provide facilities for separating materials.
- The following General Plan policies and program support implementation of this measure: Policy LU-16.2, Policy COS-4.7, Policy COS-10.3, and Program COS-7.5.

Implementation Actions:

- LG-6.1: Audit City facilities to identify opportunities to increase material recovery and beneficial use of organic material.
- LG-6.2: Develop and adopt a City policy that requires all new City-owned and -operated facilities to provide recycling receptacles.

The City, as described in the General Plan, will continue to take a leadership role in implementing programs that increase recycling, composting, and source reduction, for example, through sustainable purchasing policies and practices. Such practices will reduce the amount of solid waste that is delivered to landfills serving the City and the resulting GHG emissions. Recycling and source reduction will also reduce the demand for limited natural resources used to manufacture products.



2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings	
30 MT CO <sub>2</sub> e	42 MT CO <sub>2</sub> e	Very Low	Very Low	None	None	

Trees and plants remove carbon dioxide from the atmosphere in a process called carbon sequestration. By maintaining a healthy urban forest, prolonging the life of trees, and increasing the number of trees, the city can increase its net carbon storage over the long term. Trees and vegetation also reduce local surface and air temperatures, which reduces cooling-related energy use.

#### **LG-7: Tree Planting on City Property**

#### Increase the number of native and drought-tolerant trees planted on City property.<sup>1</sup>

Objective: Plant 2,000 trees on City properties by 2020 and an additional 1,000 trees by 2030 (for a total of 3,000 trees planted on municipal properties between 2005 and 2030). Please note, the City has already planted 1,536 trees on City property, and therefore, is already over halfway to meeting this objective.

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the City has planted 1,536 trees on parkland within San Marcos.
- The following General Plan policies and program support implementation of this measure: Policy LU-6.1, Program LU-2.2, and Policy PR-1.4.

#### Implementation Actions:

LG-7.1: Identify and secure grant funding to plant additional trees on City properties.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
71 MT CO₂e	106 MT CO₂e	Very High	Low	None	None

<sup>&</sup>lt;sup>1</sup> For the purposes of this document, City property would include right of way, City parks, and/or property owned by the City.

## 3.3 Energy Measures

Energy use accounted for 45 percent of San Marcos' total GHG emissions in 2005. These emissions result from the combustion of fossil fuel, primarily coal, oil, and natural gas, which is used to heat, cool, and provide power to residential, commercial, and industrial buildings and other facilities. Factors affecting energy-related emissions in buildings include building design and the efficiency of technology and electronics in buildings. GHG emissions reductions can be achieved by changes to both energy demand (e.g., improving energy efficiency and reducing consumption) and energy supply (e.g., switching from a high-carbon to a low- or zero-carbon technology or fuel). The energy measures listed in Table 3-3 focus on these strategies and have the potential to reduce San Marcos' GHG emissions by 23,436 MT CO<sub>2</sub>e by 2020 and by 68,388 MT  $CO_2e$  by 2030.

# operating costsLower maintenance

Reduced energy and

Co-Benefits of Energy

In addition to reducing GHG

measures described in this

benefits to the community,

section have the potential to

emissions, the energy

provide other important

Measures

including:

- Lower maintenance costs and extended equipment lives
- Increased building resale value
- Strengthened local economy
- Resource conservation
- Increased electricity reliability
- Improved air quality

Table 3-3
Energy GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reduction (MT CO₂e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
E-1	Energy Efficiency of Existing Buildings	5,691	16,255
E-2	Energy Efficient New Construction	5,096	28,178
E-3	Energy Efficiency Outreach and Incentives	7,284	14,266
E-4	Smart Meters	2,050	3,307
E-5	On-Site Small-Scale Solar Energy	3,315	6,382
<b>Energy Tot</b>	al	23,436	68,388

Increasing the energy efficiency of buildings is one of the most-cost effective approaches for reducing GHG emissions. Many improvements can be applied to existing buildings through low- to no-cost investments to improve energy efficiency, such as using efficient lighting, installing insulation, sealing air leaks, adding weather stripping, installing programmable thermostats, and upgrading HVAC systems.





#### E-1: Energy Efficiency of Existing Buildings

Facilitate voluntary energy assessments, retrofits, and retrocommissioning of existing residential and non-residential buildings within San Marcos.

*Objective*: Reduce energy use in existing buildings 3 percent by 2020 and 9 percent by 2030.

Existing and/or Completed Efforts in Support of Measure:

- The City participates in two Property Assessed Clean Energy (PACE) programs that allow local governments, via assessment and community financing districts, to offer loans to eligible property owners to finance energy efficiency upgrades and renewable energy systems.
- The following General Plan policies support implementation of this measure: Policy LU-2.4, Policy COS-4.5, Policy COS-4.6, and Policy COS-4.9.

#### Implementation Actions:

- E-1.1: Collaborate with SDG&E and local businesses and organizations to promote residential and non-residential energy assessment programs with no cost, basic, and advanced energy upgrade packages that leverage existing rebates.
- E-1.2: Work with SDG&E and local businesses and organizations to conduct additional outreach and promotional activities targeting specific groups (e.g., owners of buildings built prior to Title 24, income-gualified households, etc.).
- E-1.3: Promote energy audit and retrofit programs and PACE financing programs through the City's website, newsletter, and social media sites, and at community events.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
5,691 MT CO₂e	16,255 MT CO <sub>2</sub> e	Very Low to Low	None	None	Varies

#### **E-2: Energy Efficient New Construction**

Increase the efficient use of energy and conservation of available resources in the design and construction of new buildings.

*Objective:* 15 percent of homes and 3 percent of non-residential buildings built between 2005 and 2020 are Zero Net Energy; 100 percent of homes (per State law) and 15 percent of non-residential buildings built between 2020 and 2030 are Zero Net Energy.<sup>1</sup>

Existing and/or Completed Efforts in Support of Measure:

- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.2, Policy LU-2.3, Program LU-2.1, Program LU-2.3, Program LU-2.4, Policy COS-4.5, Policy COS-4.6, Program COS-4.3 (Mitigation Measure AQ-3), and mitigation measures GHG-3 and GHG-5.
- The Zoning Ordinance includes lighting standards for new development, which requires the utilization of the lowest wattage and highest energy efficient lamps available.

#### Implementation Actions:

- E-2.1: Develop and/or promote incentives (e.g., expedited plan review, public recognition, existing state and utility financial incentives, etc.) for projects that voluntarily exceed Title 24 Energy Efficiency Building Standards.
- E-2.2: Provide green building resources and promote workshops offered by community organizations.
- E-2.3: Provide public recognition of Zero Net Energy projects built in advance of State requirements.

#### What is Zero Net Energy?

Zero Net Energy means the amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building. A Zero Net Energy building may also consider embodied energy – the quantity of energy required to manufacture and supply to the point of use, the materials utilized for its building.

The state's Long-term Energy Efficiency Strategic Plan calls for Zero Net Energy buildings. Through a combination of energy efficient design features and on-site clean distributed generation, Zero Net Energy buildings result in no net purchases from the electricity or natural gas grid, thereby avoiding the associated GHG emissions from power plants and the grid. Increased installation of high-efficiency technologies like solar hot water heaters and combined heat and power systems are strategies to reduce natural gas use and meet energy needs more efficiently.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
5,096 MT CO₂e	28,178 MT CO <sub>2</sub> e	Very Low	None	None	Varies

<sup>&</sup>lt;sup>1</sup> As part of the State's Long Term Energy Efficiency Strategic Plan, the 2019 Title 24 Standards will require that all new residential construction be Zero Net Energy by 2020, and that all new non-residential construction be Zero Net Energy by 2030.

The City has promoted a number of SDG&E's energy efficiency and conservation events and incentive programs through its newsletter, online news, and event flvers. Under this measure, the City will continue to encourage efficiency improvements by partnering with organizations, such as SDG&E, SANDAG, and San Diego Energy Resource Center to provide and promote energy efficiency and conservation programs.





#### E-3: Energy Efficiency Outreach and Incentives

Increase energy efficiency and conservation by promoting existing incentive programs and providing targeted education and outreach.

Objective: Reduce energy use by 3 percent in residential buildings and 4 percent in non-residential buildings by 2020. Reduce energy use by 7 percent in residential buildings and 8 percent in non-residential buildings by 2030.

Existing and/or Completed Efforts in Support of Measure:

The following General Plan policies support implementation of this measure: Policy COS-4.5 and Policy COS-4.6.

#### Implementation Actions:

- E-3.1: Work with SDG&E to promote use of utility financial incentives to improve energy efficiency, such as by using on-bill financing, rebates and tax credits, and demand management programs.
- E-3.2: Conduct additional outreach and promotional activities, either individually or in collaboration with SDG&E and/or local businesses and organizations, targeting specific groups within the community (e.g., homeowners, renters, businesses, income-qualified households, etc.).
- Designate one week per year to conduct an E-3.3: energy efficiency outreach campaign. The campaign can also be used to recognize and encourage programs and outreach conducted by industry organizations, government agencies, and other community groups.
- E-3.4: Work with SDG&E to hold a free educational workshop in San Marcos regarding energy conservation, efficiency and environmental impact of energy use on the community as a whole.
- E-3.5: Promote via media (e.g., website, newsletter, social media, etc.).

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
7,284 MT CO₂e	14,266 MT CO <sub>2</sub> e	Very Low to Low	None	None	Varies

#### **E-4: Smart Meters**

Increase the community's awareness, understanding, and use of real-time energy consumption data and pricing available through SDG&E's Smart Meter program.

*Objective:* Achieve a 1 percent decrease in residential and non-residential energy usage by 2020 and a 2 percent decrease in residential and non-residential energy usage by 2030.

Existing and/or Completed Efforts in Support of Measure:

 The following General Plan EIR mitigation measure supports implementation of this measure: Mitigation Measure GHG-5

#### Implementation Actions:

- E-4.1: Assist SDG&E in its efforts to educate residents and business owners about Smart Meters, how to monitor electricity use, and the potential benefits associated with Smart Meters.
- E-4.2: Inform the community of metering options, such as online applications and in-home monitors.
- E-4.3: Connect residents and businesses with rebate and incentive programs that give priority to appliances with smart grid technology through the City's website.

Smart meters are digital devices that collect energy-use data. Unlike traditional meters, they transmit and receive data allowing for two-way communication between SDG&E and customers. The meter records energy use information (every hour at residences and every 15 minutes at businesses) which is sent to SDG&E's energy center for billing and customer service. Customers can go online to view gas and electricity usage on a daily basis. Monitoring energy use more closely allows customers to identify ways to save energy (and money) (SDG&E, 2013).



2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
2,050 MT CO <sub>2</sub> e	3,307 MT CO₂e	Very Low	None	None	Very Low

Solar energy technologies convert particles of light from the sun into electricity or heat. There are several types of solar energy systems. Solar PV systems use cells to convert particles into electrical energy. The cells are organized into arrays which vary in size depending on how much electricity is needed. Solar water heating systems use a solar collector to concentrate heat in water pipes or tanks in order to heat water (USEPA, 2013).





#### E-5: On-Site Small-Scale Solar Energy

Facilitate the installation and use of on-site smallscale solar energy systems, such as solar PV systems and solar water heaters.

Objective: Achieve installation of 2,750 kW of solar PV systems on existing residential buildings and 5,500 kW solar PV systems on existing non-residential buildings by 2020, and an additional 2,750 kW of solar PV systems on existing residential buildings and 5,000 kW of solar PV systems on existing non-residential buildings by 2030. Achieve installation of 500 residential and 75 commercial solar water heaters by 2020 and an additional 250 residential and 225 commercial solar water heaters by 2030.

Existing and/or Completed Efforts in Support of Measure:

- Between 2007 and the beginning of 2013, 1,531 kW of solar PV systems were installed on residential buildings and 2,148 kW of solar PV systems were installed on non-residential buildings in San Marcos.<sup>2</sup>
- The City's review and permit process for small solar PV installations is consistent with the California Solar Permitting Guidebook (June 2012). Clear written instructions are available on the City's website and at the permit counter.
- The City participates in two Property Assessed Clean (PACE) that allow local Energy programs governments, via assessment and community financing districts, to offer loans to eligible property owners to finance energy efficiency upgrades and renewable energy systems.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.2, Policy COS-4.5, Policy COS-4.8, Program COS-4.4 (Mitigation Measure AQ-4 and GHG-4), and Mitigation Measure GHG-5.

<sup>&</sup>lt;sup>2</sup> California Solar Initiative. Geographical Statistics. Available at: http://www.californiasolarstatistics.ca.gov/reports/locale\_stats/

#### Implementation Actions:

- E-5.1: Encourage local homebuilders to participate in the New Solar Homes Partnership to install solar photovoltaic systems on qualifying new homes.
- E-5.2: Expand education on and promotion of existing incentive, rebate, and financing programs for solar PV systems and solar hot water heaters, such as those offered through the California Solar Initiative, targeting specific groups or sectors within the community.



There are numerous federal, state, and other incentives to promote solar energy use.
These include:

CaliforniaFIRST: finances energy and water improvements on commercial properties.

Energy Upgrade California: provides resources to connect with contractors and learn about rebates and incentives.

California Solar Initiative: a statewide program that offers cash back for installing solar on homes and businesses.

New Solar Homes Partnership: a statewide program that provides financial incentives and other support to home builders to encourage the construction of energy efficient solar homes.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
3,315 MT CO <sub>2</sub> e	6,382 MT CO₂e	None	None	None	Varies

#### Co-Benefits of **Transportation and Land Use Measures**

The transportation and land use measures in this section will not only help reduce GHG emissions, but also provide multiple benefits to the community. These include:

- Reduced transportation
- Reduced noise, air, and water pollution
- Reduced traffic congestion
- Improved public health
- Strengthened local economy
- Improved infrastructure
- Increased equity
- Increased community interaction
- Increased housing and travel options
- Resource conservation

## Transportation and Land Use Measures

Transportation-related emissions make up the largest portion (35 percent) of San Marcos' GHG emissions inventory, resulting in 144,517 MT CO<sub>2</sub>e annually. Factors affecting GHG emission from transportation include the number of vehicle miles traveled (VMT), fuel economy, and the type of fuel used. The number of VMT is directly influenced by the geographic distribution of people and places, especially the density of development and zoning. Therefore, land use measures are included as reduction policies in this section.

The measures in this section focus on reducing GHG emissions from transportation fuel consumption by reducing VMT. This involves reducing automobile dependence by facilitating smart growth development patterns, promoting walking, bicycling, and public transit as viable travel options, and managing transportation demand. The transportation and land use measures listed in Table 3-4 focus on these strategies and have the potential to reduce San Marcos' GHG emissions by 23,867 MT CO<sub>2</sub>e by 2020 and by 50,736 MT  $CO_2e$  by 2030.

**Table 3-4** Transportation and Land Use GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reduction (MT CO <sub>2</sub> e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
T-1	Smart Growth	2,674	9,622
T-2	Bicycle and Pedestrian Environment	2,326	3,139
T-3	Transit Travel	7,432	14,447
T-4	Commute Trip Reduction	1,564	2,438
T-5	Traffic Flow and Vehicle Idling	6,326	9,850
T-6	Low Carbon/Alternative Fuel Vehicles	3,545	11,240
Transporta	ation and Land Use Total	23,867	50,736

#### T-1: Smart Growth

# Facilitate sustainable development based on smart growth principles.

*Objective:* Increase service population density within the city 35 percent by 2020 and 64 percent by 2030; 25 percent of new development located within 2 miles of shopping/transit/job centers; and 10 percent of new development with two or more land use types (e.g., residential and commercial).

Existing and/or Completed Efforts in Support of Measure:

- The General Plan includes policies and implementation programs that allow for, support, and incentivize development based on smart growth principles. In addition, the land use plan reflects smart growth concepts and promotes a land use pattern that enhances community connections. Planned development capacity in San Marcos under the General Plan would occur primarily through infill and redevelopment activities in the approved specific plan areas and the Focus Areas, which are consistent with SANDAG's Smart Growth Opportunity Areas map.
- The General Plan includes a number of land use designations that facilitate smart growth, including four mixed use designations, higher density residential designations allowing up to 45 dwelling units per acre, and a neighborhood commercial designation. The General Plan also calls for a Transitional Zoning category to facilitate viable, appropriate, and timely transitions of existing land uses to mixed use development. Implementation of the General Plan would increase the density and mix of uses in specific plan and Focus Areas.
- The General Plan Mobility Element focuses on complete streets and the entire circulation system is developed around this concept.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-1.1, Policy LU-1.3, Policy LU-1.5, Policy LU-1.6, Policy LU-2.1, Policy, LU-3.1 through LU-3.6, Policy LU-3.10, Policy LU-5.1, Policy LU-5.6, Policy LU-5.8, Policy LU-6.4, Policy LU-7.1, Policy LU-7.2, Policy LU-8.3, Program

The basic Smart Growth principles identified in the San Marcos General Plan are summarized as follows:

- Provide for a mixture of compatible land uses on a single site
- Take advantage of compact building design
- Create a range of housing opportunities and choices
- Create walkable neighborhoods
- Foster distinctive, attractive communities with a strong sense of place
- Land use and community design element
- Preserve open space, natural beauty, and critical environmental areas
- Strengthen and directing development toward existing communities
- Provide a variety of transportation choices
- Integrate land use and transit



The General Plan includes five key new land use designations that further support smart growth in San Marcos. The High-Density Residential designation, would allow for multi-story, multifamily developments within walking distance of commercial centers and transit services. The Mixed Use designations [Mixed Use 1, Mixed Use 2, Mixed Use 3 (Non-Residential), Mixed Use 4 (Non- Residential)] provide for a variety of commercial, office professional, civic, business park, and residential uses integrated as a cohesive development that may be mixed "vertically," with some designations encouraging pedestrian scale and orientation at the street level. Mixed use designations identified in the General Plan include both a mix of residential and nonresidential uses or a mix of commercial and office uses.

- LU-1.1 (Mitigation Measure AGR-1 and LU-1), Program LU-1.2, Program LU-1.3, Program LU-1.4, Program LU-3.1, Program LU-3.2, Program LU-5.1, Program LU-6.1, Program LU-6.4, Policy M-4.1, Policy M-4.2, Program M-3.1 (Mitigation Measure TT-2), Program M-4.1, Policy H-1.2, and Policy H-1.6.
- The Zoning Ordinance identifies incentives for mixeduse development, including parking reductions, shared parking, collective parking, and "park once" programs. It also includes standards for pedestrian and bicycle circulation and access.

#### Implementation Actions:

- T-1.1: Provide and promote incentives for smart growth identified in the General Plan.
- T-1.2: Work with SANDAG in the updates to the Smart Growth Concept Map.
- T-1.3: Showcase smart growth projects on the City's website and in newsletters, etc.
- T-1.4: Through the development review process, evaluate development projects based on consistency with the City's adopted General Plan 2030, updated zoning regulations, and applicable design guidelines, as well as SANDAG Smart Growth publications, including Designing for Smart Growth, Creating Great Places in the San Diego Region (2009) and Planning and Designing for Pedestrians, Model Guidelines for the San Diego Region (2002).

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
2,674 MT CO₂e	9,622 MT CO₂e	Very Low	None	None	Varies

#### **T-2: Bicycle and Pedestrian Environment**

## Continue to expand and improve the City's bicycle and pedestrian network.

*Objective:* Achieve a 2 percent reduction in annual light-duty VMT in 2020 and a 3 percent reduction in annual light-duty VMT in 2030 as a result of a mode shift to bicycling and walking.

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the City has implemented numerous bikeway, sidewalk, multi-use trail, safe routes to school, and traffic calming projects. Most of the older parks and public facilities and all new park projects have bicycle parking.
- The San Marcos Trails Master Plan envisions a 72-mile-long interconnected trail system. The City currently (2013) owns and manages 60 miles of completed trails; an additional 8 miles of trails are designated on approved building plans. When completed, the inter-linked city-wide system of trails will provide greater connectivity between residential neighborhoods, recreational areas, employment areas, schools, colleges, and neighboring cities.
- In 2005, the City adopted the San Marcos Bikeway Master Plan, which was developed to obtain State Bicycle Transportation Account grant funds, improve bicycle facilities throughout the city for safer routes to school, provide connections to adjacent cities, and incorporate an environmental inventory analysis.
- The City's Traffic Signal Manual includes specifications for bicycle detections, pedestrian countdown signals and audible pedestrian push buttons.
- The Zoning Ordinance includes standards for bicycle parking and shower and locker facilities in new development. A parking reduction incentive is offered to projects that include shower and storage locker facilities for bicycle commuters or additional secure bicycle parking facilities over and above the minimum requirement. It also includes requirements for pedestrian circulation, emphasizing a high level of connectivity.



Promoting safe and convenient bicycle and pedestrian infrastructure encourages biking and can help limit the number of private automobile trips. Bicycling and walking are non-polluting, and cost- and energy-efficient; bicycling and walking reduce transportation-related GHG emissions while also supporting community health.





• The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-3.1, Policy LU-3.3, Policy LU-3.4, Policy LU-3.5, Policy LU-3.10, Policy LU-5.8, Policy LU-7.1, Policy LU-7.2, Program LU-1.4, Program LU-3.3, Program LU-5.3, Program LU-7.2 (Mitigation Measure PSU-1), Program LU-8.2, Policy M-1.2, Policy M-1.4, Policy M-1.6, Policy M-1.7, Policy M-1.9, Policy M-1.10, Policy M-2.1, Policy M-2.2, Policy M-3.1, Policy M-3.2, Policy M-3.3, Policy M-3.4, Policy M-3.5, Policy M-3.9, Program M-1.1, Program M-2.1, Program M-3.1 (Mitigation Measure TT-2), Program M-4.1, Policy PR-1.2, Policy PR-1.4, Policy PR-2.2, Program PR-1.1, Program PR-2.2, Policy N-2.3, and Program N-2.1.



#### Implementation Actions:

- T-2.1: Continue to pursue public and private funding to expand and link the City's bicycle and pedestrian network in accordance with the General Plan, Bikeway Master Plan, and Trails Master Plan.
- T-2.2: Incorporate multi-modal improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of work.
- T-2.3: Establish minimum design criteria for pedestrian circulation and implement through the design review process.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
2,326 MT CO <sub>2</sub> e	3,139 MT CO₂e	Very Low	None	None	Varies

#### **T-3: Transit Travel**

# Continue to expand and improve the transit network and its accessibility within San Marcos.

*Objective:* Achieve a daily intra-city shuttle ridership of 500 passengers by 2030. Achieve an increase in transit ridership to 3 percent of the city's service population by 2020 and 4 percent by 2030.

Existing and/or Completed Efforts in Support of Measure:

- In 2008, NCTD began operation of the light rail SPRINTER, which has four stations within the city.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-7.2, Policy M-1.2, Policy M-1.4, Policy M-1.5, Policy M-1.6, Policy M-1.7, Policy M-3.1, Policy M-3.6, Policy M-3.7, Policy M-3.9, Program M-1.1, Program M-3.1 (Mitigation Measure TT-2), and Policy N-2.3.

#### Implementation Actions:

- T-3.1: Coordinate with NCTD and SANDAG to facilitate the use of transit by increasing its safety and cleanliness, providing real-time information and making other quality improvements.
- T-3.2: Coordinate with SANDAG to identify and implement Safe Routes to Transit programs and projects within San Marcos.
- T-3.3: Through the development review process, require new development to provide safe routes to adjacent transit stops, where applicable, and to finance and construct bus turnouts and shelters adjacent to new projects where transit demand warrants such improvements.
- T-3.4: Require new development at transit nodes and along transit corridors to meet planning and design standards to generate, attract, and facilitate transit ridership as a condition of approval.

The availability of safe, reliable, convenient, and affordable public transportation, such as buses and light rail, can encourage individuals to take public transit over private vehicles, which results in fewer VMT and GHG emissions. The city has an extensive, multimodal network of public transit routes offering local and regional connections between San Marcos and adjacent cities. There is also a tremendous opportunity to connect some of the key activity centers, including the San Marcos Creek District and the University District, with the City through an intra-city shuttle system that the City is currently working to implement. Further, Safe Routes to Transit improvements that ensure safe pedestrian and bicycle access to transit stations within San Marcos can help to increase transit as a viable travel option and remove barriers that may exist.



2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
7,432 MT CO₂e	14,447 MT CO <sub>2</sub> e	Very Low to Low	None	None	Varies

Transportation Demand Management (TDM) is a general term for strategies that increase overall system efficiency by encouraging a shift from SOV trips to non-SOV modes, or shifting auto trips out of peak periods. TDM seeks to facilitate this shift by increasing travel options and by providing incentives and information. Given the network of mobility options San Marcos has (and envisions expanding as part of this General Plan) and the educational facilities at the City, TDM has the potential to be extremely successful within San Marcos.

iCommute is a regional commute alternatives program that provides free assistance to local businesses/organizations to develop and implement customized employee commuter benefit programs. iCommute also assists commuters by providing free carpool and ridematching services, a subsidized vanpool program, transit solutions, bicycling support, the Guaranteed Ride Home program, and SchoolPool carpooling programs for parents.

#### **T-4: Commute Trip Reduction**

Promote **Transportation Demand Management** (TDM) programs and SANDAG's regional commute trip reduction program, iCommute, that give commuters and employers resources and incentives to reduce their single-occupancy vehicle (SOV) trips.

*Objective:* Achieve a 5 percent decrease in SOV mode share of commute VMT by 2020 and a 7 percent decrease in SOV mode share of commute VMT by 2030.

Existing and/or Completed Efforts in Support of Measure:

- The following General Plan policies and programs support implementation of this measure: Policy LU-3.7, Policy LU-3.8, Program LU-6.1, Program LU-8.2, Policy M-1.3, and Program M-1.2.
- Municipal Code includes The transportation demand/trip reduction requirements to ensure that new non-residential development provides adequate alternative transportation facilities or programs and provide preferred parking for carpool and vanpool vehicles.

- T-4.1: Provide targeted marketing and promotion of commute trip reduction programs, consistent with SANDAG's Integrating Transportation Demand Management into the Planning and Development Process report (May 2012).
- T-4.2: Provide information on, and links to, commuter assistance programs and employer services offered through SANDAG on the City's website.
- T-4.3: Provide information on and promote existing employer based TDM programs as part of the business licensing and renewal process.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
1,564 MT CO₂e	2,438 MT CO₂e	Very Low	None	None	Varies

#### **T-5: Traffic Flow and Vehicle Idling**

Implement improvements to smooth traffic flow, reduce idling, eliminate bottlenecks, and encourage efficient driving techniques.

*Objective:* Achieve a 9 percent increase in fuel economy from 2 percent of the population in 2020 and 5 percent of the population in 2030. Achieve an 8.6 percent reduction in light-duty vehicle idling below 2005 levels by 2020 and a 10.5 percent reduction below 2005 levels by 2030.

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the City has:
  - Implemented an adaptive traffic control system along San Marcos Boulevard with 15 signalized intersections.
  - Coordinated 9 signals along the Rancho Santa Fe Avenue corridor.
  - Coordinated 8 signals along the Las Posas corridor.
  - Coordinated 7 signals along the West Missions Road corridor.
  - Coordinated signals in the Twin Oaks corridor along San Marcos Blvd to the northerly City boundaries.
- In 2003, the City opened the Traffic Management Center (TMC), which is a critical part of an advanced traffic management system that manages traffic flow in the City. The City has implemented signal coordination on some of its heavily traveled corridors, including implementation of state of the art signal optimization strategies such as adaptive signal control. Ongoing improvements include installing additional traffic upgrading traffic cameras, controllers. deploying an adaptive traffic control system on San Marcos Boulevard, and establishing a fiber optic communication network to interconnect many of the City's signals and traffic cameras.
- The following General Plan policies support implementation of this measure: Policy LU-3.8, Policy M-1.8, and Policy M-2.3.

Vehicles are the most fuel efficient when traveling at steady speeds. With poorly timed traffic signals, drivers spend more time idling and in stop-and-go traffic. This inefficient driving wastes fuel and increases GHG emissions. Optimizing the timing of traffic signals can significantly reduce traffic congestion, fuel use, and GHG emissions (California Energy Commission, 2011).

The Traffic Management Center (TMC) at San Marcos City Hall is a critical part of an advanced traffic management system that manages traffic flow in the City. Traffic engineers staffing the TMC can check signal operations, adjust signal synchronization timing and monitor traffic progression throughout the City. This helps reduce traffic congestion, vehicle idling, and resulting GHG emissions.





- T-5.1: Continue to utilize technology and intelligent transportation systems to improve traffic flow and reduce vehicle idling, such as synchronized signals, transit and emergency signal priority, and other traffic flow management techniques.
- T-5.2: Conduct education campaigns to promote fuelefficient driving ("eco-driving") practices such as reduced idling, slower driving speeds, gentle acceleration, and proper tire inflation.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
6,326 MT CO₂e	9,850 MT CO₂e	None	None	None	Varies

#### **T-6: Low Carbon/Alternative Fuel Vehicles**

# Expand the availability and use of alternative fuel vehicles and fueling infrastructure.

*Objective:* Achieve a 2 percent reduction in light-duty vehicle emissions above Advanced Clean Car Standards in 2020 and a 5 percent reduction in 2030. Achieve a switch of 10 percent of heavy-duty vehicles to alternative fuels (e.g., compressed natural gas) by 2020 and 20 percent switch to alternative fuels by 2030.

#### Existing and/or Completed Efforts in Support of Measure:

- The following General Plan policy and programs and General Plan EIR mitigation measure support implementation of this measure: Policy M-3.8, Program M-3.1 (Mitigation Measure TT-2), and Program M-4.1.
- The Zoning Ordinance includes standards for electric vehicle parking and charging stations in new developments or remodeling or expansion of existing development.

#### Implementation Actions:

- T-6.1: Work with SANDAG and community organizations to implement the San Diego Regional Plug-In Vehicle Readiness Plan as it pertains to San Marcos.
- T-6.2: Coordinate with the California Center for Sustainable Energy and the California Plug-In Electric Vehicle Collaborative to develop streamlined permitting requirements, standardized design guidelines, and siting criteria for all types of electric charging stations.
- T-6.3: Encourage the development of a compressed natural gas or other alternative fueling stations within the City to support the conversion of heavy-duty gasoline and diesel vehicles to alternative fuels.

The use of alternative fuels, such as electricity, compressed natural gas (CNG), and liquid petroleum gas (LPG) offers an opportunity to reduce GHG emissions without relying on substantial reductions in transportation demand.

The City of San Marcos participated in the development of the San Diego Regional Electric Vehicle Readiness Plan, and is working with regional agencies and developers to install recharging stations to support electric vehicle use.





2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
3,545 MT CO₂e	11,240 MT CO <sub>2</sub> e	Very Low	None	None	Varies

### Co-Benefits of Off-Road Equipment Measures

The off-road measures in this section will not only help reduce GHG emissions, but will also provide multiple benefits to the community. These include:

- Improved air and water quality
- Reduced noise pollution
- Improved public health

## 3.5 Off-Road Equipment Measures

Emissions in the off-road sector result from the combustion of fuel, primarily diesel, gasoline, and compressed natural gas, which is used to power off-road equipment and vehicles. Off-road equipment and vehicles include those used in construction, agriculture, commercial, industrial, and landscaping operations as well as recreational vehicles. Factors affecting off-road emissions include the age, type, and usage of the vehicle or equipment.

GHG emissions reductions can be achieved by reducing offroad equipment and vehicle usage and idling or by using equipment that runs on electricity or alternative fuels. The off-road equipment measures listed in Table 3-5 focus on these strategies and have the potential to reduce San Marcos' GHG emissions by 4,807 MT CO<sub>2</sub>e by 2020 and by 9,316 MT CO<sub>2</sub>e by 2030.

Table 3-5
Off-Road Equipment GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reduction (MT CO <sub>2</sub> e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
0-1	Construction Equipment Efficiency and Fuels	4,627	8,793
0-2	Lawn and Garden Equipment	180	523
Off-Road	Equipment Total	4,807	9,316

#### **O-1: Construction Equipment Efficiency and Fuels**

Require projects seeking discretionary approval from the City to implement all feasible measures for reducing GHG emissions associated with construction equipment.

*Objective:* 5 percent of construction vehicles and equipment utilize new technologies (repowered engines, electric drive trains), CARB-approved low carbon fuel, or are electrically-powered by 2020 and 15 percent by 2030.



 The following General Plan EIR mitigation measures support implementation of this measure: Mitigation Measure AQ-1 and Mitigation Measure GHG-1.

- O-1.1: Through the construction permitting process, limit construction vehicle and equipment idling to 3 minutes and require the project applicant to post clear signs for workers at the entrances to the site.
- O-1.2: Through the construction permitting process, require a percentage of construction vehicles and equipment to use equipment with new technologies (repowered engines, electric drive trains), use CARB-approved low carbon fuel, or be electrically-powered.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
4,627 MT CO <sub>2</sub> e	8,793 MT CO₂e	None	None	Varies	Varies



#### What is Xeriscaping?

Xeriscaping is landscaping with slow-growing, droughttolerant plants to conserve water and reduce yard maintenance and trimmings. Xeriscapes also generally require less fertilizer and fewer pest control measures than traditional landscapes. Because pesticides and fertilizers can inadvertently harm beneficial organisms, as well as impact air and water quality, reducing their use is a good idea (CalRecycle, 2013).



#### **O-2: Lawn and Garden Equipment**

#### Promote xeriscaping to reduce yard trimmings and landscape maintenance.

Objective: Achieve a 10 percent reduction in lawn and garden equipment and associated GHG emissions in 2020 and 25 percent reduction in 2030 as a result of lowmaintenance landscaping.

Existing and/or Completed Efforts in Support of Measure:

- The Zoning Ordinance includes landscaping standards that require the use of native drought-tolerant landscaping.
- The following General Plan policy and program and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.5, Program COS-5.4 (GP Mitigation Measure HWQ-3), and Mitigation Measure GHG-5.

#### Implementation Actions:

0-2.1: Provide educational workshops and training to promote the installation of low-maintenance native landscaping in new and existing developed lots and remove turf to reduce lawn and garden equipment usage.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
180 MT CO₂e	523 MT CO <sub>2</sub> e	None	None	None	Varies

#### 3.6 Water and Wastewater Measures

The conveyance, treatment, and distribution of water can result in significant GHG emissions depending on the water source, distances and topography traversed in conveyance, and the treatment processes that occur before and after the end-use phase. Water usage in San Marcos totaled approximately 5,008 million gallons in 2005 and resulted in 12,757 MT  $CO_2e$  of emissions.

Emissions from wastewater are generated from the energy needed to convey and treat wastewater as well as emissions of methane and nitrous oxide generated during the process of wastewater treatment. Emissions from wastewater in San Marcos totaled 6,568 MT CO<sub>2</sub>e in 2005.

Emissions from water and wastewater use can decrease by reducing overall water consumption and by improving wastewater treatment plant processes to reduce and capture GHG emissions. The water and wastewater measures listed in Table 3-6 focus on these strategies and have the potential to reduce San Marcos' GHG emissions by 4,405 MT CO<sub>2</sub>e by 2020 and by 8,373 MT CO<sub>2</sub>e by 2030.

# Co-Benefits of Water and Wastewater Measures

The water and wastewater measures in this section will not only help reduce GHG emissions, but also provide multiple benefits to the community. These include:

- Reduced costs
- Improved air quality
- Reduced water consumption
- Reduced energy consumption
- Improved public health

Table 3-6
Water and Wastewater GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reduction (MT CO₂e)	2030 GHG Reduction (MT CO2e)
W-1	Exceed SB X7-7 Water Conservation Target	806	2,901
W-2	Recycled Water	240	1,442
W-3	Wastewater Treatment Plant Upgrades	3,359	4,030
Water and	Wastewater Total	4,405	8,373

The Water Conservation Act of 2009 (SB X7-7) requires all water suppliers to increase water use efficiency. The legislation sets an overall goal of reducing per capita urban water use by 20 percent by 2020, with an interim target of 10 percent reduction by 2015. By July 2011, urban water retailers were required to determine baseline and target daily per capita water use. Urban water retail suppliers who do not meet the water conservation requirements will not be eligible for state water grants or loans (California Department of Water Resources, 2013).

#### W-1: Exceed SB X7-7 Water Conservation Target

Identify water conservation goals that exceed the SB X7-7 (Water Conservation Act of 2009) target and identify and implement additional water efficiency and conservation measures to meet those goals by 2020 and 2030.

*Objective:* Exceed SB X7-7 water conservation target by 5 percent in 2020 and 15 percent in 2030.

Existing and/or Completed Efforts in Support of Measure:

 The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.5, Policy LU-8.1, Policy LU-13.2, Program LU-8.6 (Mitigation Measure PSU-2), Policy COS-5.1, Policy COS-5.2, Policy COS-5.3, Program COS-5.4 (Mitigation Measure HWQ-3), Program COS-5.5 (Mitigation Measure HWQ-4), and Mitigation Measure GHG-5.

#### Implementation Actions:

W-1.1: Work with the City's water purveyors to develop and/or help implement additional water conservation and efficiency programs (e.g. water efficiency audits, replacement/retrofit programs, etc.).

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
806 MT CO <sub>2</sub> e	2,901 MT CO₂e	Very Low	None	None	Varies

#### W-2: Recycled Water

# Expand opportunities for the use of recycled water within the community.

*Objective:* Expand recycled water use in the community to 3 percent of total water usage by 2020 and 15 percent by 2030.

Existing and/or Completed Efforts in Support of Measure:

- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Program LU-8.6 (Mitigation Measure PSU-2), Program LU-8.7, Policy COS-5.1, Policy COS-5.2, Policy COS-5.3, Program COS-5.3 (Mitigation Measure GHG-10), and Program COS-5.5 (Mitigation Measure HWQ-4).
- The Municipal Code includes dual plumbing requirements for new development and requires new development and landscaped public areas to utilize state-of-the-art irrigation systems that reduce water consumption, including graywater systems and rainwater catchment where feasible.

Implementation Actions:

W-2.1: Educate the community on graywater and rainwater recycling for irrigation.

Recycled water is wastewater purified through treatment processes to be used again. It is treated to regulatory requirements for non-potable use, and then distributed through a separate system of pipes. Indirect potable reuse involves taking recycled water that meets all regulatory requirements for non-potable use, treating it further with several advanced treatment processes to meet potable water standards, and then adding it to an untreated potable water supply like a surface reservoir or a groundwater aquifer.



2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
240 MT CO <sub>2</sub> e	1,442 MT CO₂e	None	None	None	Varies

**GHG** emissions associated with wastewater are from the electricity needed to convey and treat wastewater as well as emissions of methane and nitrous oxide from treatment processes. Wastewater from San Marcos is treated at the Encina Water Pollution Control Facility operated by the **Encina Wastewater** Authority.

#### W-3: Wastewater Treatment Plant Upgrades

Coordinate with the wastewater treatment plant operator on opportunities for co-generation and methane capture.

*Objective:* Achieve 80 percent methane capture and a 10 percent reduction in energy use associated with emissions from treatment of the city's wastewater.

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the Encina Wastewater Authority, which treats wastewater from San Marcos, optimized its cogeneration plant by converting three engines to lean-burn technology and upgrading the anaerobic digester gas management system to improve gas quality. All anaerobic digester gas is now utilized, and the plant provides 80 to 90 percent of the treatment plant's electrical requirements.
- By 2020, the Encina Wastewater Authority plans to implement energy efficient and biogas technologies expected to increase self-generated electricity of the plant by 43 percent.

#### Implementation Actions:

W-3.1: Periodically coordinate with the Encina Wastewater Authority to identify upgrades to the wastewater treatment plant that result in GHG emissions reductions.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
3,359 MT CO₂e	4,030 MT CO <sub>2</sub> e	Very Low	None	None	None

#### 3.7 Solid Waste Measures

As solid waste decomposes in landfills, it releases methane, a GHG 21 times more potent than carbon dioxide. In 2005, the solid waste sector generated approximately 21,714 MT  $\rm CO_2e$ .

Waste management is an important action that the community can take to reduce GHG emissions. Waste management can be achieved by reducing the amount of trash and other waste that is discarded; reusing containers, products, and building materials; and recycling as many materials as possible, including green waste and construction materials. The solid waste measure listed in Table 3-7 focuses on waste management and has the potential to reduce San Marcos' GHG emissions by 7,538 MT  $CO_2e$  by 2020 and by 10,553 MT  $CO_2e$  by 2030.

Table 3-7
Solid Waste GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reduction (MT CO <sub>2</sub> e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
S-1	Solid Waste Reduction and Recycling	7,538	10,553
Solid Waste Total		7,538	10,553

# **Co-Benefits of Solid Waste Measures**

In addition to reducing GHG emissions, the solid waste measures described in this section have the potential to provide other important benefits to the community. These include:

- Cost savings
- Improved air quality
- Reduced solid waste generation
- Resource conservation



#### S-1: Solid Waste Reduction and Recycling

Increase recycling, composting, source reduction, and education efforts throughout San Marcos to reduce the amount of solid waste sent to landfills.

*Objective:* Obtain a city-wide 75 percent diversion rate by 2020 and city-wide 85 percent diversion rate by 2030.

Existing and/or Completed Efforts in Support of Measure:

- Since 2005, the City has purchased 103 park and 24 clear stream recycling containers for use at City special events. Escondido Disposal Company (EDCO) provides containers for City-event recycling.
- AB 341 requires the provision of recycling containers at businesses that generate 4 cubic yards or more of commercial solid waste per week and multi-family residential dwellings of 5-units or more. It also requires the diversion of at least 50 percent of nonhazardous construction and demolition debris.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-16.2, Program LU-6.1, Program LU-8.10, Policy COS-10.1, through COS-10.3, Program COS-7.1, Program COS-7.2 (GP Mitigation Measure GHG-6), Program COS-7.3 (Mitigation Measure GHG-7), Program COS-7.4 (Mitigation Measure GHG-2), Program COS-7.5, and mitigation measures GHG-1 and GHG-5.
- The Municipal Code includes water efficient landscaping standards, which were adopted in 2011.

- S-1.1: Develop and adopt city-wide goals for solid waste diversion.
- S-1.2: Work with EDCO to identify additional diversion and outreach programs (e.g. home composting workshops, tiered rate structures, additional outreach, and/or recycling incentives), as necessary, to meet the established goals.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
7,538 MT CO₂e	10,553 MT CO <sub>2</sub> e	Very Low	None	Varies	None

#### **Urban Greening Measures** 3.8

Trees and other vegetation absorb and capture the GHG carbon dioxide from the atmosphere in a process called carbon sequestration. By maintaining a healthy urban forest, prolonging the life of trees, and continually increasing the number of trees, San Marcos can increase its net carbon storage over the long term. Trees and other vegetation also reduce local air and surface temperatures by shading buildings, streets, and sidewalks.

The urban greening measure listed in Table 3-8 has the potential to reduce San Marcos' GHG emissions by 35 MT  $CO_2e$  by 2020 and by 71 MT  $CO_2e$  by 2030.

### **Table 3-8 Urban Greening GHG Reductions by Measure**

Measure Number	Measure	2020 GHG Reduction (MT CO <sub>2</sub> e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
U-1	Community Tree Planting	35	71
Communit	y Tree Planting Total	35	71

### Co-Benefits of Urban **Greening Measures**

In addition to reducing GHG emissions, the urban greening measure described in this section has the potential to provide other important benefits to the community. These include:

- City beautification
- Increased property values
- Improved air quality
- Improved water quality
- Improved public health
- Reduced surface and air temperatures
- Reduced energy usage and associated costs
- Reduced noise pollution

The City of San Marcos contains approximately 2,499 acres (or 12 percent) of open space and approximately 340 acres of developed parkland (General Plan EIR, 2012) that contain thousands of trees. Retaining open space in its natural state and preserving trees provides many benefits to the community, in addition to reducing GHG emissions, such as absorbing air pollutants from the air, reducing storm water runoff, creating a more attractive environment, and increasing property values. Studies have found that access to trees and natural environments can improve mental and physical health, improve job productivity, and reduce crime (U.S. Department of Agriculture Forest Service, 1997).



#### **U-1: Community Tree Planting**

Facilitate planting of native and drought-tolerant trees and vegetation within public rights of way and private development.

Objective: Facilitate the planting of 1,000 new trees in the community by 2020 and an additional 1,000 trees by 2030 (total of 2,000 trees by 2030).

Existing and/or Completed Efforts in Support of Measure:

- The former 200-acre San Marcos Landfill, now closed, has been re-vegetated with native coastal sage scrub and chaparral habitat and will remain as open space.
- In 2012, the City completed a comprehensive inventory of trees located within the City of San Marcos and established a citywide tree pruning contract.
- Through the City's Living Tree Donation program, community members can sponsor the planting and maintenance of a tree within San Marcos.
- The Zoning Ordinance includes landscaping standards and tree replacement requirements for development, and shade tree requirements for new parking lots.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.7, Program LU-2.2, Policy M-3.9, Program COS-5.4 (Mitigation Measure HWQ-3), and Mitigation Measure GHG-5.

- U-1.1: Develop and adopt tree planting guidelines that address tree and site selection, with emphasis placed on native, drought-tolerant trees.
- U-1.2: Through the development review process, track the number of trees planted annually that exceed mitigation requirements.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
35 MT CO₂e	71 MT CO₂e	Very Low	None	None	Varies

# 3.9 Community Education and Outreach Measures

Community involvement, public education, and outreach are critical to promote individual actions that help reduce GHG emissions and maximize their effect. The City can encourage community members to take the steps necessary to reduce their contribution of GHG emissions by providing information about climate change science and anticipated impacts, and by connecting residents and businesses with information, tools, and resources to help them take action. Effective public participation will increase the likelihood that the climate action measures identified in this plan achieve their GHG reduction potential.

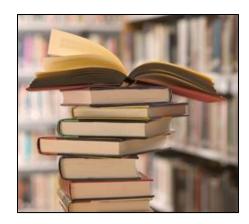
# **Co-Benefits of Education** and Outreach Measures

In addition to reducing GHG emissions, the community education and outreach measure described in this section has the potential to provide other important benefits to the community. These include:

- Municipal leadership
- Increased community interaction
- Supports all other GHG reduction measures

Table 3-9
Community Education and Outreach GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO2e)	2030 GHG Reduction (MT CO <sub>2</sub> e)
C-1	Community Education and Outreach	Supportive	Supportive
Communit	y Tree Planting Total	Supportive	Supportive



#### **C-1: Community Education and Outreach**

Develop a public outreach program to increase public awareness of potential climate change impacts, the City's GHG reduction efforts, and actions community members can take to reduce their GHG emissions.

Objective: Establish a CAP public outreach program.

Existing and/or Completed Efforts in Support of Measure:

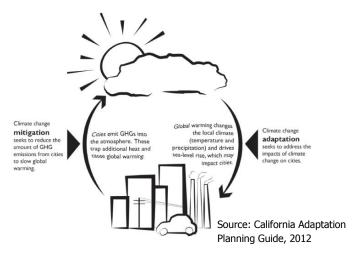
None at this time.

- C-1.1: Create a climate action page on the City's website and update every six months.
- C-1.2: Establish a section in the City newsletter that raises awareness of climate change and ways to reduce GHG emissions, with an emphasis on cost savings and benefits.
- C-1.3: Recognize individuals, groups, or businesses that have made changes to reduce their GHG emissions on the City's climate action page, in the City newsletter, or other mechanisms.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
Supportive	Supportive	High to Very High	None	None	None

## 3.10 Adapatation Measures

Two types of responses to climate change are available: mitigation and adaptation. The previous focus areas have primarily addressed reducing GHG emissions to help limit future climate change. This section addresses adaptation, or preparing for and managing risk associated with climate change effects.



Chapter 1.0, Introduction, describes the potential climate change effects that San Marcos could expect based on current science and understanding, which include an increase in average annual temperature and heat waves, a decrease in the consistent supply of fresh water, increased risk of wildfires, negative impacts on biodiversity, and an increased risk to public health. The adaptation measures provide a basic framework for integrating climate change risk assessment and management into current planning processes. Where appropriate, the adaptation measures also highlight GHG reductions measures from other sections of the CAP that also contribute to adaptation.

### How is climate adaptation related to hazard mitigation planning?

Natural hazard impacts are only one area that may be affected by climate change. Other areas that may be affected include agricultural, forestry, and fisheries productivity; ecosystem structure and function; and public health. Planning in all of these areas should be done in light of potential climate change impacts. For local hazard mitigation plan development, climate change should be incorporated into the assessment of hazards risk. Ideally, measures identified in the hazard mitigation plan would address both current hazards needs and future climate-change affected hazards.

Table 3-10
Impacts of Climate Change

Primary Impact	Associated Secondary Impacts
Changed temperature and/or precipitation patterns	Changed seasonal patterns, intense rainstorms
Increased temperature	Heat wave
Wildfire	Landslide
Increased temperature/reduced precipitation	Heat wave, drought, wildfire, reduced snowpack

Source: California Adaption Planning Guide, 2012

Potential climate change impacts related to hazards and health risks within the San Diego region include increases in average annual temperature; more frequent, longer and more extreme heat waves; adverse air quality; increased wildfire frequency and intensity; reduced water supply; increased risk of infectious diseases; and loss of agricultural production (San Diego Regional Focus 2050 Study). Populations, structures and functions within San Marcos may be particularly vulnerable to these anticipated changes.

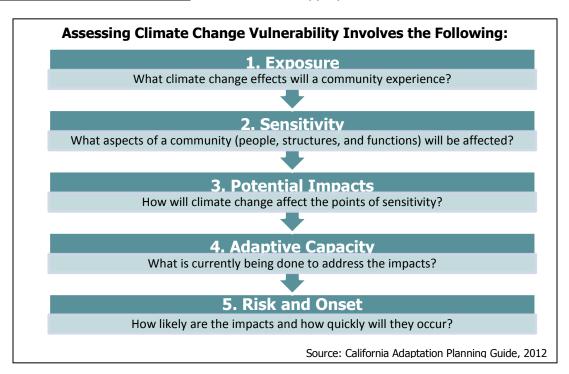
#### A-1: Climate Change Vulnerability

### Identify and periodically reassess regional climate change vulnerabilities.

Existing and/or Completed Efforts in Support of Measure:

The San Diego County Multi-Jurisdictional Hazard Mitigation Plan (last updated in 2010) identifies goals, objectives and actions for the City of San Marcos which help facilitate implementation of this measure.

- A-1.1: Participate in inter-agency and or interjurisdictional meeting and planning activities to identify and periodically reassess regional climate change vulnerabilities.
- A-1.2: Incorporate newly identified adaptation measures into planning documents appropriate.



2020 GHG	2030 GHG	City	City	Private	Private
Reduction	Reduction	Cost	Savings	Cost	Savings
N/A	N/A	Very Low	None	None	

#### A-2: Public Health, Socioeconomics and Equity

Prepare for anticipated climate change effects on public health, the local economy, and populations that may bear a disproportionate burden of the climate change effects.

Existing and/or Completed Efforts in Support of Measure:

- The City's Municipal Code includes development standards and regulations to ensure that new development located in or near areas that may pose public health and safety hazards (such as flood plains and fire hazard zones) is designed to avoid and/or minimize potential impacts on people and property. The County of San Diego Consolidated Fire Code and the San Marcos Fire Department Wildland Urban Interface Community Wildfire Protection Plan also include requirements and policies for the protection of public health and safety from fire-related incidents.
- The San Diego County Multi-Jurisdictional Hazard Mitigation Plan, San Diego Air Pollution Control District's Air Quality Management Plan and State Implementation Plan, and Unified San Diego County Emergency Services Organization Operational Area Emergency Plan help facilitate implementation of this measure.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.6, Policy LU-2.7, Policy LU-10.1, Policy LU-10.3, Program LU-2.2, Program LU-8.1, Policy COS-2.1, Policy COS-2.2, Policy COS-2.3, Policy COS-4.2, Policy PR-1.1, Policy PR-2.2, Policy PR-2.3, Policy PR-2.4, Policy PR-2.6, Program PR-2.1, Program PR-2.3, Program PR-2.5, Program PR-2.6, Policy S-1.1, Policy S-3.1, Policy S-3.2, Policy S-3.3, Policy S-3.4, Policy S-5.3, Program S-1.2, Program S-2.2, Program S-3.1 (Mitigation Measure HM-7), Program S-3.3, Program S-3.4, Program S-3.5, Program S-5.1, Program S-5.3 (Mitigation Measure HM-5), and Program S-5.4 (Mitigation Measure HM-6).

Public health impacts include the short-term effects of climate-related hazards—heat events, intense rainstorms and flooding, wildfires, and high tide and storm surges—and long-term impacts such as cardio-respiratory morbidity and mortality, food-, waterand vector-borne diseases, food insecurity and water contamination.

**Socioeconomic** impacts include potential effects upon California's economic growth and on specific industries within the state, such as agriculture and tourism. These changes increase the vulnerability of local populations that rely on these industries.

**Equity** concerns are based on the idea that some populations bear a disproportionate burden of the climate change effects (California Adaptation Planning Guide, 2012).

# Reducing the Urban Heat Island Effect

As urban areas develop, they become warmer than their rural surroundings, forming an "island" of higher temperatures in the landscape. This is known as the urban heat island effect.

Urban heat island mitigation strategies serve to alleviate heat threats by limiting the degree to which the sun can heat an urban environment. Increased tree cover in an urban area reduces experience of heat in urban settings. Trees limit the extent to which urban surfaces warm, cool local temperature through evapotranspiration, and provide shade to residents and nearby buildings. As a co-benefit, these programs serve to sequester GHGs, result in more appealing streets, and can add value to property.

The City's General Plan contains a policy and implementation program to facilitate reducing the urban heat island effect within San Marcos. CAP Measures LG-7 and U-1 also facilitate tree planting and support mitigation of the urban heat island effect within San Marcos.

- A-2.1: Continue to coordinate with the San Diego County Office of Emergency Services to update the Multi-Jurisdictional Hazard Mitigation plan to address the hazards and public health risks associated with climate change.
- A-2.2: Collaborate with community-based organizations (such as health care providers, public health advocates, fire prevention organizations, etc.) to disseminate public preparedness and emergency response information related to climate change.
- A-2.3: Identify and focus planning and outreach programs on neighborhoods that currently experience social or environmental injustice or bear a disproportionate burden of potential public health impacts.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
N/A	N/A	Very Low	None	None	None

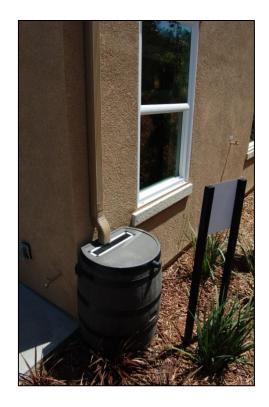
#### **A-3: Water Management**

Prepare for anticipated climate change effects on water, including surface water systems, groundwater, flooding, drought, and water supply and limit community exposure to threats such as flooding.

Existing and/or Completed Efforts in Support of Measure:

- The City's Municipal Code includes development standards and regulations that restrict development in floodplains.
- The City's Public Works Department inspects and cleans storm drain inlets, outlets and channels on an annual basis.
- The City's Engineering Department studies mitigation needs for any development downstream of existing dams and maintains a Jurisdictional Urban Runoff Management Plan, which includes guidelines and requirements for sediment and erosion control.
- The San Diego County Multi-Jurisdictional Hazard Mitigation Plan, San Diego Stormwater Copermittees Hydromodification Management Plan, San Diego Municipal Stormwater Permit, and regional and local Urban Water Management Plans help facilitate implementation of this measure.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-2.5, Policy LU-2.7, Policy LU-13.1, Policy LU-13.2, Policy LU-13.3, Policy LU-15.1, Policy LU-15.2, Policy LU-15.3, Policy LU-15.4, Program LU-8.5 (Mitigation Measure PSU-3), Program LU-8.6, Program LU-8.7, Program LU-8.8, Policy COS-2.2, Policy COS-5.1, Policy COS-5.2, Policy COS-5.3, Policy COS-6.1, Policy COS-6.2, Policy COS-6.3, Policy COS-7.1, Policy COS-7.2, Policy COS-8.4, Policy COS-9.1, Policy COS-9.2, Policy COS-9.3, Program COS-5.1 (Mitigation Measure GHG-8), Program COS-5.2 (Mitigation Measure GHG-9 and HWQ-1), Program COS-5.3 (Mitigation Measure GHG-10 and HWQ-2), Program COS-5.4 (Mitigation Measure HWQ-3), Program COS-5.5 (Mitigation Measure HWO-4), COS-6.1 (Mitigation Program Program COS-6.2 Measure HWQ-5), (Mitigation

Climate change may result in flooding, drought, and/or reduced water supply in communities. Although the scientific evidence regarding increased flooding related to climate change remains uncertain, it is prudent for communities to recognize that changes to precipitation regimes and rate/timing of snowmelt may increase flooding. The water supply includes both surface water and ground water, along with the infrastructure necessary for management, conveyance, and treatment. Water supply is expected to be affected in areas that experience less precipitation and areas dependent on snowpack (California Adaptation Planning Guide, 2012).



Water resources are vital to San Marcos. There are a number of beneficial uses of water resources in the city's watersheds including: municipal and domestic supply, agricultural supply, industrial service supply, contact and noncontact water recreation, preservation of biological habitats of special significance, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and rare, threatened, or endangered species. Moreover, the City recognizes the interconnectedness of water quality including surface, storm, and wastewater management; water supply; and natural resources. In addition, the potential for flooding in San Marcos is high due in part to the City's topography, which is characterized by several steep ridgelines that border a few wide valleys. It is therefore imperative that the City protect its water resources and related infrastructure, and prepare for potential climate change effects.

Measure	HWQ-6),	Program	COS-6.3	(HWQ-7),
Program	COS-6.4	(Mitigation	Measure	HWQ-8),
Program	COS-6.5	(Mitigation	Measure	HWQ-9),
Program	COS-6.6	(Mitigation	Measure	HWQ-10),
Program	COS-6.7	(Mitigation	Measure	HWQ-11),
Program	COS-6.8	(Mitigation	Measure	HWQ-12),
Mitigation	Measure	BR-4, and	Mitigation	Measure
GHG-5.				

- A-3.1: Continue to seek grants and other sources of funding, including the State Integrated Regional Water Management Grant Program and mitigation opportunities, to enhance flood control and improve water quality.
- A-3.2: Implement the CAP measures that facilitate water conservation and the use of recycled water.



2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
N/A	N/A	None	None	None	None

#### **A-4: Biodiversity and Habitat**

Protect biodiversity and habitats by carefully managing open space and creating connections between areas of undeveloped land.

Existing and/or Completed Efforts in Support of Measure:

- The San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Habitat Loss Permit Ordinance, Multiple Habitat Conservation Plan, North County Multiple Species Conservation Program and Biological Mitigation Ordinance, and Resource Protection Ordinance help facilitate implementation of this measure.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-1.4, Policy LU-3.5, Program LU-2.2, Policy COS-1.1 through COS-1.3, Policy COS-2.1, Policy COS-2.2, Policy COS-2.6, Policy COS-3.3, Program COS-1.1, Program COS-1.2 (Mitigation Measure BR-3), Program COS-1.3 (Mitigation Measure BR-6), Program COS-2.1, mitigation measures BR-2 and BR-10.
- The General Plan land use pattern is consistent with SANDAG's RTP/SCS, which accommodates the region's future employment and housing needs, while protecting sensitive habitats and resource areas.

#### Implementation Actions:

- A-4.1: Continue to identify and protect locations where native species may shift or lose habitat due to climate change impacts (e.g., warmer temperatures, drought).
- A-4.2: Continue to collaborate with agencies managing public lands to identify or maintain corridors and linkages between undeveloped areas.

Climate change may affect terrestrial and freshwater aquatic habitats and the species that depend on them. California is a unique hot spot of biodiversity (California Energy Commission, 2009). Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species' ranges, loss of ecosystem functions, and changes in growing ranges for vegetation (California Adaptation Planning Guide, 2012).

San Marcos is located in the Multiple Habitat Conservation Program (MHCP) project area, which encompasses 111,908 acres, and provides conservation for 77 species. The City began preparing a draft of the Subarea Plan of the MHCP in December 1999. Although the draft has not yet been approved by the U.S. Fish and Wildlife Service and the California Department of Fish and Game, the plan is a component of the MHCP and is currently being uses as a guide for open space design within the City.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
N/A	N/A	Very Low	None	None	None

#### A-5: Infrastructure

Work to improve the resilience of systems that provide the resources and services critical to community function.

Existing and/or Completed Efforts in Support of Measure:

- The San Diego County Multi-Jurisdictional Hazard Mitigation Plan (last updated in 2010) identifies goals, objectives and actions for the City that help facilitate implementation of this measure.
- The following General Plan policies and programs and General Plan EIR mitigation measures support implementation of this measure: Policy LU-10.1, Policy LU-15.2, Policy LU-15.4, Program LU-7.2, Program LU-8.1, Program LU-8.11, Policy S-2.1, Policy S-2.2, Policy S-3.1 through S-3.4, Program S-1.1, Program S-1.2, S-2.2, Program S-3.1 (Mitigation Measure HM-8), Program S-3.2 (Mitigation Measure HM-7), Program S-3.3 through S-3.5, Program S-5.3 (Mitigation Measure HM-5), and Program S-5.4 (Mitigation Measure HM-6).

- A-5.1: Assess the potential impact of climate change as part of the update of plans that manage community infrastructure systems.
- A-5.2: Complete an assessment for projected climate change impacts on local transportation, water, wastewater, stormwater, energy, and communication systems.
- A-5.3: Implement the CAP measures that facilitate energy and water conservation and the use of recycled water and renewable energy.

2020 GHG Reduction Potential	2030 GHG Reduction Potential	City Cost	City Savings	Private Cost	Private Savings
N/A	N/A	Very Low	None	None	None

## 3.11 GHG Reduction Summary

As discussed in Section 2.3 of Chapter 2, GHG Emissions and Reduction Targets, San Marcos will need to reduce its emissions by 58,960 MT  $CO_2e$  by 2020 and by 148,694 MT  $CO_2e$  by 2030 to meet its targets. The GHG reduction measures in this CAP are estimated to reduce San Marcos' GHG emissions by 64,876 MT  $CO_2e$  by 2020 and by 148,731 MT  $CO_2e$  by 2030, as summarized in Table 3-11. Therefore, implementation of the measures identified in this chapter would enable San Marcos to meet its reduction targets by 2020 and 2030.

**Table 3-11: Summary of GHG Reductions by Measure** 

Measure Number	Measure	2020 GHG Reduction (MT CO₂e)	2030 GHG Reduction (MT CO <sub>2</sub> e)						
Local Government									
LG-1	CAP Implementation	Supportive	Supportive						
LG-2	Municipal Energy Efficiency and Conservation	239	477						
LG-3	Solar Energy for City Buildings and Facilities	61	61						
LG-4	Low Emission Fleet Vehicles	144	203						
LG-5	Employee Commute Alternatives	243	405						
LG-6	Municipal Solid Waste Diversion	30	42						
LG-7	Tree Planting on City Property	71	106						
	Local Government Total	788	1,294						
Energy									
E-1	Energy Efficiency of Existing Buildings	5,691	16,255						
E-2	Energy Efficient New Construction	5,096	28,178						
E-3	Energy Efficiency Outreach and Incentives	7,284	14,266						
E-4	Smart Meters	2,050	3,307						
E-5	On-Site Small-Scale Solar Energy	3,315	6,382						
	Energy Total	23,436	68,388						
Transport	ation and Land Use								
T-1	Smart Growth	2,674	9,622						
T-2	Bicycle and Pedestrian Environment	2,326	3,139						
T-3	Transit Travel	7,432	14,447						
T-4	Commute Trip Reduction	1,564	2,438						
T-5	Traffic Flow and Vehicle Idling	6,326	9,850						
T-6	Low Carbon/Alternative Fuel Vehicles	3,545	11,240						
	Transportation and Land Use Total	23,867	50,736						
Off-Road Equipment									
O-1	Construction Equipment Efficiency and Fuels	4,627	8,793						
0-2	Lawn and Garden Equipment	180	523						
	Off-Road Equipment Total	4,807	9,316						
Water and	d Wastewater								
W-1	Exceed SB X7-7 Water Conservation Target	806	2,901						
W-2	Recycled Water	240	1,442						
W-3	Wastewater Treatment Plant Upgrades	3,359	4,030						
	Water and Wastewater Total	4,405	8,373						
Solid Waste									
S-1	Solid Waste Reduction and Recycling	7,538	10,553						
	Solid Waste Total	7,538	10,553						
Urban Greening									
U-1	Community Tree Planting	35	71						
	Urban Greening 35 71								
Communi	ty Education and Outreach								
C-1	Community Education and Outreach	Supportive	Supportive						
	Total	64,876	148,731						





Implementation and monitoring are essential components of the CAP to ensure that San Marcos reduces its GHG emissions and meets its targets. This chapter identifies key steps that the City will take to implement the CAP and monitor the progress in reducing San Marcos' GHG emissions and meeting its targets. It also describes potential funding sources and mechanisms available to implement the CAP.

# 4.1 Implementation

Ensuring that the CAP measures translate into measurable reductions in GHG emissions is critical to the success of the CAP. To facilitate this, each measure and its corresponding implementation actions identified in Chapter 3, Climate Action Measures, is listed in the implementation matrix in Table 4-1 along with the following items:

- **Responsible Parties(s):** the City department or division that will be primarily responsible for implementing, monitoring, and reporting on the progress of the measure and corresponding actions.
- Implementation Timeframe: the phase in which measure implementation should begin. Timeframes include:
  - Near-Term By 2015
  - o Mid-Term 2016-2019
  - o Long-Term 2020-2030

- City Cost and Savings Estimates: for each measure, potential costs and savings to the City are identified. Additional information on costs and savings is provided in Appendix C.
- **GHG Reduction Potential:** the GHG reduction potential value identifies the estimated annual GHG emissions reductions anticipated by 2020 and 2030, measured in MT CO<sub>2</sub>e per year. Supporting information pertaining to the reduction potential calculations is provided in Appendix B.
- Performance Criteria: performance criteria or indicators enable the City to generally monitor measure progress.

Upon adoption of the CAP, the City will establish a CAP Coordinator who will provide essential CAP oversight and a multi-departmental CAP Implementation Team comprised of key staff in each department. These individuals will facilitate and oversee the implementation and monitoring of measures for which their department is responsible. The CAP Implementation Team will meet at least one time per year to assess the status of City efforts. Some actions will require interdepartmental or inter-agency cooperation and appropriate partnerships will need to be established accordingly.

**Table 4-1 Implementation Matrix** 

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
Local Government	Operations Measures						
LG-1 CAP Implementation: Establish a City CAP Coordinator and multi-departmental CAP Implementation Team to implement, monitor, and report on the status of measures and actions identified in the CAP.	LG-1.1: Form a multi-departmental CAP Implementation Team that meets annually to implement, monitor, and report on the status of measures and actions identified in the CAP according to the implementation and monitoring chapter.  LG-1.2: Designate a City staff member on the CAP Implementation Team to have lead responsibilities for implementing the CAP and monitoring progress. Duties of this position include coordinating the CAP Implementation Team, preparing the annual CAP progress report to the City Council, and coordinating the GHG emissions inventory and CAP updates as specified in the implementation and monitoring chapter.  LG-1.3: Provide CAP implementation and GHG reduction training to City staff.	Development Services, Community Services, Code Enforcement, Housing & Neighborhood Services, Public Works, Redevelopment /Economic Development	\$40,000-\$46,000	None	2020: Supportive 2030: Supportive	Establish a City CAP Coordinator and multi- departmental CAP Implementation Team.	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
LG-2 Municipal Energy Efficiency and Conservation: Reduce the amount of energy used at City buildings and facilities.	LG-2.1: Develop and implement a schedule to address cost-effective municipal energy retrofit and improvement projects (e.g., appliance and equipment upgrades, reducing overall lighting or hours of operation, additional efficient lighting and lighting control systems, cool roofs, shade trees, retrocommissioning, items identified in the San Marcos Energy Roadmap, etc.). LG-2.2: Work with SDG&E to access technical assistance and financial incentives, such as facility audits, rebates, on-bill financing, loans, grants, and savings-by-design programs. LG-2.3: Participate in the SDG&E Emerging Technologies Program, as feasible, and use City facilities to showcase emerging energy efficient technologies. LG-2.4: Identify staff positions or employees that could benefit from energy-related workshops and trainings and require their participation in SDG&E, Center for Sustainable Energy, or other relevant workshops, seminars, or certification programs.	Public Works, Development Services, Human Resources & Risk, Real Property Services	\$3,000-\$6,000	\$549,494	<b>2020:</b> 239 MT CO <sub>2</sub> e <b>2030:</b> 477 MT CO <sub>2</sub> e	Reduce the amount of energy used at City buildings and facilities by 10% below 2005 levels by 2020 and 20% below 2005 levels by 2030.	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
LG-3 Solar Energy for City Buildings and Facilities: Continue to install on-site small-scale solar PV systems at municipal facilities.	<b>LG-3.1:</b> Identify and secure funding (e.g., through grants, on-bill financing, loans, energy performance contracts, lease-purchase agreements, or other mechanisms) to install additional solar PV systems at City properties and facilities.	Public Works, Development Services, Real Property Services	None	None	<b>2020:</b> 61 MT CO <sub>2</sub> e <b>2030:</b> 61 MT CO <sub>2</sub> e	Install 186 kW of solar PV systems by 2020. Please note the City has already met this objective, installing 186 kWh of solar between 2006 and 2013.	Near-Term
Emission Fleet Vehicles: Continue to increase overall City fleet fuel efficiency and the use of low carbon fuels.	LG-4.1: Develop a low- and zero- emissions replacement/ purchasing policy for official City vehicles and equipment. This would not apply to vehicles with special performance requirements. LG-4.2: Identify and secure funding (e.g., through the San Diego Regional Clean Cities Coalition, California Air Resources Board, California Energy Commission, and/or California Center for Sustainable Energy) to purchase low- and zero-emissions fleet vehicles and equipment. LG-4.3: Work with individual departments with vehicle fleets and equipment to develop fuel saving policies and programs (e.g., using fleet management software to monitor fleet use and performance, training in fuel-efficient driving, route logistics planning, etc.).	Public Works	\$66,584- \$69,584	\$8,648	<b>2020:</b> 144 MT CO <sub>2</sub> e <b>2030:</b> 203 MT CO <sub>2</sub> e	Reduce GHG emissions associated with the City's vehicle and equipment fleet by 15% below 2005 levels by 2020 and 21% below 2005 levels by 2030 (equivalent to about 4 vehicles replaced between 2006 and 2013 [already completed], 2 vehicles replaced between 2013 and 2019, and 6 more vehicles replaced between 2020	

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
						and 2030, for a total of 12 vehicles replaced between 2006 and 2030.)	
LG-5 Employee Commute Alternatives: Implement programs and provide incentives to reduce annual VMT associated with City employee commutes.	LG-5.1: Participate in SANDAG's free iCommute program to develop and implement a customized commuter benefit program for City employees, including incentives such as pre-tax benefits and/or discounted transit passes. LG-5.2: Establish an iCommute employer network to track the number of City employees participating in the program and measure the City's financial and environmental savings. LG-5.3: Work with iCommute to provide employee outreach. LG-5.4: Participate in and promote annual regional commute trip reduction events.	Development Services, Human Resources & Risk	\$3,600-\$7,600	None	<b>2020:</b> 243 MT CO <sub>2</sub> e <b>2030:</b> 405 MT CO <sub>2</sub> e	Reduce annual VMT associated with employee commutes by 15% from 2005 levels by 2020 and 25% from 2005 levels by 2030.	Mid-Term
LG-6 Municipal Solid Waste Diversion: Reduce the amount of landfilled solid waste generated at City facilities.	<ul> <li>LG-6.1: Audit City facilities to identify opportunities to increase material recovery and beneficial use of organic material.</li> <li>LG-6.2: Develop and adopt a City policy that requires all new Cityowned and -operated facilities to provide recycling receptacles.</li> </ul>	Public Works, Housing & Neighborhood Services	\$2,000-\$4,000	<\$5,000	<b>2020:</b> 30 MT CO <sub>2</sub> e <b>2030:</b> 42 MT CO <sub>2</sub> e	Reduce City- generated solid waste by 25% below 2005 levels by 2020 and by 35% below 2005 levels by 2030.	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
LG-7 Tree Planting on City Property: Increase the number of native and drought- tolerant trees planted on City property.	LG-7.1: Identify and secure grant funding to plant additional trees on City properties.	Public Works, Development Services, Community Services	\$439,200	\$22,500- \$48,750	2020: 71 MT CO <sub>2</sub> e 2030: 106 MT CO <sub>2</sub> e	Plant 2,000 trees on City properties by 2020 and an additional 1,000 trees by 2030 (for a total of 3,000 trees planted on municipal properties between 2005 and 2030). Please note, the City has already planted 1,536 trees on City property, and therefore, must plant an additional 464 trees by 2020 and an additional 1,000 trees by 2030.	Mid-Term
Energy							
E-1 Energy Efficiency of Existing Buildings: Facilitate voluntary energy	<b>E-1.1:</b> Collaborate with SDG&E and local businesses and organizations to promote residential and non-residential energy assessment programs with no cost, basic, and advanced energy upgrade packages	Development Services, Housing & Neighborhood Services, Real Property	\$6,800- \$13,600 <sup>1</sup>	None	2020: 5,691 MT CO₂e 2030: 16,255 MT	Reduce energy use in existing buildings 3% by 2020 and 9% by 2030.	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
assessments, retrofits, and retrocommissioning of existing residential and non-residential buildings within San Marcos.	that leverage existing rebates. <b>E-1.2:</b> Work with SDG&E and local businesses and organizations to conduct additional outreach and promotional activities targeting specific groups (e.g., owners of buildings built prior to Title 24, income-qualified households, etc.). <b>E-1.3:</b> Promote energy audit and retrofit programs and PACE financing programs through the City's website, newsletter, and social media sites, and at community events.	Services, Redevelopment / Economic Development			CO₂e		
E-2 Energy Efficient New Construction: Increase the efficient use of energy and conservation of available resources in the design and construction of new buildings.	<b>E-2.1:</b> Develop and/or promote incentives (e.g., expedited plan review, public recognition, existing state and utility financial incentives, etc.) for projects that voluntarily exceed Title 24 Energy Efficiency Building Standards. <b>E-2.2:</b> Provide green building resources and promote workshops offered by community organizations. <b>E-2.3:</b> Provide public recognition of Zero Net Energy projects built in advance of State requirements.	Development Services, Code Enforcement	\$1,000- \$2,000 <sup>1</sup>	None	2020: 5,096 MT CO₂e 2030: 28,178 MT CO₂e	15% of homes and 3% of non-residential buildings built between 2005 and 2020 are Zero Net Energy; 100% of homes (per State law) and 15% of non-residential buildings built between 2020 and 2030 are Zero Net Energy.	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
E-3 Energy Efficiency Outreach and Incentives: Increase energy efficiency and conservation by promoting existing incentive programs and providing targeted education and outreach.	E-3.1: Work with SDG&E to promote use of utility financial incentives to improve energy efficiency, such as by using on-bill financing, rebates and tax credits, and demand management programs.  E-3.2: Conduct additional outreach and promotional activities, either individually or in collaboration with SDG&E and/or local businesses and organizations, targeting specific groups within the community (e.g., homeowners, renters, businesses, income-qualified households, etc.).  E-3.3: Designate one week per year to conduct an energy efficiency outreach campaign. The campaign can also be used to recognize and encourage programs and outreach conducted by industry organizations, government agencies, and other community groups.  E-3.4: Work with SDG&E to hold a free educational workshop in San Marcos regarding energy efficiency and conservation, and the environmental impact of energy use on the community as a whole.  E-3.5: Promote via media (e.g., website, newsletter, social media, etc.).	Development Services	\$9,000- \$18,000 <sup>1</sup>	None	2020: 7,284 MT CO <sub>2</sub> e 2030: 14,266 MT CO <sub>2</sub> e	Reduce energy use by 3% in residential buildings and 4% in non-residential buildings by 2020. Reduce energy use by 7% in residential buildings and 8% in non-residential buildings by 2030.	Mid-Term
<b>E-4 Smart Meters:</b> Increase the community's	<b>E-4.1:</b> Assist SDG&E in its efforts to educate residents and business owners about Smart Meters, how to	Development Services, Housing &	\$400-\$800 <sup>1</sup>	None	<b>2020:</b> 2,050 MT CO <sub>2</sub> e	Achieve a 1% decrease in residential and	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
awareness, understanding, and use of real- time energy consumption data and pricing available through SDG&E's Smart Meter program.	monitor electricity use, and the potential benefits associated with Smart Meters. <b>E-4.2:</b> Inform the community of metering options, such as online applications and in-home monitors. <b>E-4.3:</b> Connect residents and businesses with rebate and incentive programs that give priority to appliances with smart grid technology through the City's website.	Neighborhood Services			<b>2030:</b> 3,307 MT CO <sub>2</sub> e	non-residential energy usage by 2020 and a 2% decrease in residential and non-residential energy usage by 2030.	
E-5 On-Site Small-Scale Solar Energy: Facilitate the installation and use of on-site small-scale solar energy systems, such as solar PV systems and solar water heaters.	E-5.1: Encourage local homebuilders to participate in the New Solar Homes Partnership to install solar photovoltaic systems on qualifying new homes.  E-5.2: Expand education on and promotion of existing incentive, rebate, and financing programs for solar PV systems and solar hot water heaters, such as those offered through the California Solar Initiative, targeting specific groups or sectors within the community.	Development Services, Housing & Neighborhood Services, Code Enforcement, Real Property Services	None <sup>1</sup>	None	<b>2020:</b> 3,315 MT CO <sub>2</sub> e <b>2030:</b> 6,382 MT CO <sub>2</sub> e	Achieve installation of 2,750 kW of solar PV systems on existing residential buildings and 5,500 kW solar PV systems on existing non-residential buildings by 2020, and an additional 2,750 kW of solar PV systems on existing residential buildings and 5,000 kW of solar PV systems on existing residential buildings and 5,000 kW of solar PV systems on existing non-residential	

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
						buildings by 2030. Achieve installation of 500 residential and 75 commercial solar water heaters by 2020 and an additional 250 residential and 225 commercial solar water heaters by 2030.	
Transportation							
T-1 Smart Growth: Facilitate sustainable development based on smart growth principles.	T-1.1: Provide and promote incentives for smart growth identified in the General Plan. T-1.2: Work with SANDAG in the updates to the Smart Growth Concept Map. T-1.3: Showcase smart growth projects on the City's website and in newsletters, etc. T-1.4: Through the development review process, evaluate development projects based on consistency with the City's adopted General Plan 2030, updated zoning regulations, and applicable design guidelines, as well as SANDAG Smart Growth publications, including Designing for Smart Growth, Creating Great Places	Development Services, Redevelopment / Economic Development	\$1,200- \$2,400 <sup>1</sup>	None	2020: 2,674 MT CO₂e 2030: 9,622 MT CO₂e	Increase service population density within the city 35% by 2020 and 64% by 2030. 25% of new development located within 2 miles of shopping/transit/job centers. 10% of new development with two or more land use types (e.g. residential and	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
	in the San Diego Region and Planning and Designing for Pedestrians, Model Guidelines for the San Diego Region.					commercial).	
T-2 Bicycle and Pedestrian Environment: Continue to expand and improve the City's bicycle and pedestrian network.	T-2.1: Continue to pursue public and private funding to expand and link the City's bicycle and pedestrian network in accordance with the General Plan, Bikeway Master Plan, and Trails Master Plan.  T-2.2: Incorporate multi-modal improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of work.  T-2.3: Establish minimum design criteria for pedestrian circulation and implement through the design review process.	Development Services, Public Works, Public Safety, Community Services	\$2,000-\$4,000	None	2020: 2,326 MT CO <sub>2</sub> e 2030: 3,139 MT CO <sub>2</sub> e	Achieve a 2% reduction in annual light-duty VMT in 2020 and a 3% reduction in annual light-duty VMT in 2030 as a result of a mode shift to bicycling and walking.	Near-Term
T-3 Transit Travel: Continue to expand and improve the transit network and its accessibility within San Marcos.	T-3.1: Coordinate with NCTD and SANDAG to facilitate the use of transit by increasing its safety and cleanliness, providing real-time information, and making other quality improvements.  T-3.2: Coordinate with SANDAG to identify and implement Safe Routes to Transit programs and projects within San Marcos.  T-3.3: Through the development review process, require new development to provide safe routes to	Development Services	\$6,800- \$13,600	None	<b>2020:</b> 7,432 MT CO <sub>2</sub> e <b>2030:</b> 14,447 MT CO <sub>2</sub> e	Achieve a daily intra-city shuttle ridership of 500 passengers by 2030. Achieve an increase transit ridership to 3% of the city's service population by 2020 and 4% by 2030.	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
T-4 Commute Trip Reduction: Promote Transportation Demand Management (TDM) programs and SANDAG's regional commute trip reduction program, iCommute, that give commuters and employers resources and incentives to reduce their single- occupancy vehicle (SOV) trips.	report (May 2012). <b>T-4.2:</b> Provide information on, and links to, commuter assistance programs and employer services offered through SANDAG on the City's website. <b>T-4.3:</b> Provide information on and promote existing employer based	Development Services, Human Resources & Risk	\$800-\$1,600 <sup>1</sup>	None	2020: 1,564 MT CO <sub>2</sub> e 2030: 2,438 MT CO <sub>2</sub> e	Achieve a 5% decrease in SOV mode share of commute VMT by 2020 and a 7% decrease in SOV mode share of commute VMT by 2030.	Mid-Term
T-5 Traffic Flow and Vehicle Idling: Implement	<b>T-5.1:</b> Continue to utilize technology and intelligent transportation systems to improve traffic flow and reduce vehicle idling, such as synchronized	Development Services, Public Works	None <sup>1</sup>	None	<b>2020:</b> 6,326 MT CO <sub>2</sub> e	Achieve a 9% increase in fuel economy from 2% of the	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
improvements to smooth traffic flow, reduce idling, eliminate bottlenecks, and encourage efficient driving techniques.	signals, transit and emergency signal priority, and other traffic flow management techniques. <b>T-5.2:</b> Conduct education campaigns to promote fuel-efficient driving ("ecodriving") practices such as reduced idling, slower driving speeds, gentle acceleration, and proper tire inflation.				<b>2030:</b> 9,850 MT CO <sub>2</sub> e	population in 2020 and 5% of the population in 2030. Achieve an 8.6% reduction in light-duty vehicle idling by 2020 and a 10.5% reduction by 2030.	
T-6 Low Carbon/ Alternative Fuel Vehicles: Expand the availability and use of alternative fuel vehicles and fueling infrastructure.	T-6.1: Work with SANDAG and community organizations to implement the San Diego Regional Plug-In Vehicle Readiness Plan as it pertains to San Marcos.  T-6.2: Coordinate with the California Center for Sustainable Energy and the California Plug-In Electric Vehicle Collaborative to develop streamlined permitting requirements, standardized design guidelines, and siting criteria for all types of electric charging stations.  T-6.3: Encourage the development of a compressed natural gas or other alternative fueling stations within the City to support the conversion of heavy-duty gasoline and diesel vehicles to alternative fuels.	Development Services	\$4,000- \$8,000 <sup>1</sup>	None	2020: 3,545 MT CO <sub>2</sub> e 2030: 11,240 MT CO <sub>2</sub> e	Achieve an additional 2% reduction in light-duty vehicle emissions above Advanced Clean Car Standards in 2020 and an additional 5% reduction in 2030 (total of 5% in 2020 and 23% in 2030). Achieve a switch of 10% of heavyduty vehicles to compressed natural gas by 2020 and 20%	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
						switch to compressed natural gas by 2030.	
Off-Road							
O-1 Construction Equipment Efficiency and Fuels: Require projects seeking discretionary approval from the City to implement all feasible measures for reducing GHG emissions associated with construction equipment.	O-1.1: Through the construction permitting process, limit construction vehicle and equipment idling to 3 minutes and require the project applicant to post clear signs for workers at the entrances to the site. O-1.2: Through the construction permitting process, require a percentage of construction vehicles and equipment to use equipment with new technologies (repowered engines, electric drive trains), use CARB-approved low carbon fuel, or be electrically-powered.	Development Services, Code Enforcement	None	None	<b>2020:</b> 4,627 MT CO <sub>2</sub> e <b>2030:</b> 8,793 MT CO <sub>2</sub> e	5% of construction vehicles and equipment utilize new technologies (repowered engines, electric drive trains), use CARB-approved low carbon fuel, or are electrically-powered by 2020 and 15% by 2030.	Near-Term
O-2 Lawn and Garden Equipment: Promote xeriscaping to reduce yard trimmings and landscape maintenance.	<b>O-2.1:</b> Provide educational workshops and training to promote the installation of low-maintenance native landscaping in new and existing developed lots and remove turf to reduce lawn and garden equipment usage.	Development Services	None <sup>1</sup>	None	<b>2020:</b> 180 MT CO <sub>2</sub> e <b>2030:</b> 523 MT CO <sub>2</sub> e	Achieve a 10% reduction in lawn and garden equipment and associated GHG emissions in 2020 and 25% reduction in 2030 as a result of low-	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
						maintenance landscaping.	
Water and Waster	water						
W-1 Exceed SB X7-7 Water Conservation Target: Identify water conservation goals that exceed the SB X7-7 (Water Conservation Act of 2009) target and identify and implement additional water efficiency and conservation measures to meet those goals by 2020 and 2030.	W-1.1: Work with the City's water purveyors to develop and/or help implement additional water conservation and efficiency programs (e.g. water efficiency audits, replacement/retrofit programs, etc.).	Public Works, Development Services,	\$1,000- \$2,000 <sup>1</sup>	None	<b>2020:</b> 806 MT CO <sub>2</sub> e <b>2030:</b> 2,901 MT CO <sub>2</sub> e	Exceed SB X7-7 water conservation target by 5% in 2020 and 15% in 2030.	Mid-Term
W-2 Recycled Water: Expand opportunities for the use of recycled water within the community.	<b>W-2.1:</b> Educate the community on graywater and rainwater recycling for irrigation.	Public Works, Development Services	None <sup>1</sup>	None	<b>2020:</b> 240 MT CO <sub>2</sub> e <b>2030:</b> 1,442 MT CO <sub>2</sub> e	Expand recycled water use in the community to 3% of total water usage by 2020 and 15% by 2030.	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
W-3 Wastewater Treatment Plant Upgrades: Coordinate with the wastewater treatment plant operator on opportunities for co-generation and methane capture.	<b>W-3.1:</b> Periodically coordinate with the Encina Wastewater Authority to identify upgrades to the wastewater treatment plant that result in GHG emissions reductions.	Public Works, Development Services	\$200-\$400	None	<b>2020:</b> 3,359 MT CO <sub>2</sub> e <b>2030:</b> 4,030 MT CO <sub>2</sub> e	Achieve 80% methane capture and a 10% reduction in energy use associated with emissions from treatment of the city's wastewater.	Long-Term
Solid Waste							
S-1 Solid Waste Reduction and Recycling: Increase recycling, composting, source reduction, and education efforts throughout San Marcos to reduce the amount of solid waste sent to landfills.	<b>S-1.1:</b> Develop and adopt city-wide goals for solid waste diversion. <b>S-1.2:</b> Work with EDCO to identify additional diversion and outreach programs (e.g. home composting workshops, tiered rate structures, additional outreach, recycling incentives, etc.), as necessary, to meet the established goals.	Development Services, Housing and Neighborhood Services	\$2,000- \$4,000 <sup>1</sup>	None	<b>2020:</b> 7,538 MT CO <sub>2</sub> e <b>2030:</b> 10,553 MT CO <sub>2</sub> e	Obtain a city-wide 75% diversion rate by 2020 and city-wide 85% diversion rate by 2030.	Mid-Term
Urban Greening							
U-1 Community Tree Planting: Facilitate planting of native and drought-tolerant trees and vegetation within	<b>U-1.1:</b> Develop and adopt tree planting guidelines that address tree and site selection, with emphasis placed on native, drought-tolerant trees. <b>U-1.2:</b> Through the development review process, track the number of	Public Works	\$2,000-\$4,000	None	<b>2020:</b> 35 MT CO <sub>2</sub> e <b>2030:</b> 71 MT CO <sub>2</sub> e	Facilitate the planting of 1,000 new trees in the community by 2020 and an additional	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO₂e)	Performance Criteria	Implementation Timeframe
public rights of way and private development.	trees planted annually that exceed mitigation requirements.					1,000 trees by 2030 (total of 2,000 trees by 2030).	
Community Educa	ation and Outreach						
C-1 Community Education and Outreach: Develop a public outreach program to increase public awareness of potential climate change impacts, the City's GHG reduction efforts, and actions community members can take to reduce their GHG emissions.	<ul> <li>C-1.1: Create a climate action page on the City's website and update every six months.</li> <li>C-1.2: Establish a section in the City newsletter that raises awareness of climate change and ways to reduce GHG emissions, with an emphasis on cost savings and benefits.</li> <li>C-1.3: Recognize individuals, groups, or businesses that have made changes to reduce their GHG emissions on the City's climate action page, in the City newsletter, or other mechanisms.</li> </ul>	Development Services, Human Resources & Risk	\$119,000- \$238,000	None	2020: Supportive 2030: Supportive	Establish a CAP public outreach program.	Near-Term
Adaptation							
A-1 Climate Change Vulnerability: Identify and periodically reassess regional climate change vulnerabilities.	<ul> <li>A-1.1: Participate in inter-agency and or inter-jurisdictional meeting and planning activities to identify and periodically reassess regional climate change vulnerabilities.</li> <li>A-1.2: Incorporate newly identified adaptation measures into planning documents as appropriate.</li> </ul>	Development Services	\$2,000-\$4,000	None	2020: N/A 2030: N/A	N/A	Mid-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
A-2 Public Health, Socioeconomic and Equity: Prepare for anticipated climate change effects on public health, the local economy, and populations that may bear a disproportionate burden of the climate change effects.	A-2.1: Continue to coordinate with the San Diego County Office of Emergency Services to update the Multi-Jurisdictional Hazard Mitigation plan to address the hazards and public health risks associated with climate change.  A-2.2: Collaborate with community-based organizations (such as health care providers, public health advocates, fire prevention organizations, etc.) to disseminate public preparedness and emergency response information related to climate change.  A-2.3: Identify and focus planning and outreach programs on neighborhoods that currently experience social or environmental injustice or bear a disproportionate burden of potential public health impacts.	Development Services, Public Works, Housing and Neighborhood Services	\$1,000- \$2,000 <sup>1</sup>	None	2020: N/A 2030: N/A	N/A	Mid-Term
A-3 Water Management: Prepare for anticipated climate change effects on water, including surface water systems, groundwater, flooding, drought, and water supply and limit	A-3.1: Continue to seek grants and other sources of funding, including the State Integrated Regional Water Management Grant Program and mitigation opportunities, to enhance flood control and improve water quality.  A-3.2: Implement the CAP measures that facilitate water conservation and the use of recycled water.	Development Services, Public Works	None	None	2020: N/A 2030: N/A	N/A	Near-Term

Measure	Actions	Responsible Parties(s)	Potential Cost (Aggregated)	Potential Savings (Annual)	GHG Reduction Potential (MT CO <sub>2</sub> e)	Performance Criteria	Implementation Timeframe
community exposure to threats such as flooding.							
A-4 Biodiversity and Habitat: Protect biodiversity and habitats by carefully managing open space and creating connections between areas of undeveloped land.	A-4.1: Continue to identify and protect locations where native species may shift or lose habitat due to climate change impacts (e.g., warmer temperatures, drought). A-4.2: Collaborate with agencies managing public lands to identify, develop, or maintain corridors and linkages between undeveloped areas.	Development Services	\$1,000-\$2,000	None	2020: N/A 2030: N/A	N/A	Long-Term
A-5 Infrastructure: Work to improve the resilience of systems that provide the resources and services critical to community function.	A-5.1: Assess the potential impact of climate change as part of the update of plans that manage community infrastructure systems.  A-5.2: Complete an assessment for projected climate change impacts on local transportation, water, wastewater, stormwater, energy, and communication systems.  A-5.3: Implement the CAP measures that facilitate energy and water conservation and the use of recycled water and renewable energy.	Development Services, Public Works	\$3,000-\$6,000	None	2020: N/A 2030: N/A	N/A	Long-Term

<sup>&</sup>lt;sup>1</sup> Costs associated with community education and outreach related to this measure are accounted for under Measure C-1.

# 4.2 Monitoring

This section describes how the City will monitor the CAP's implementation and performance, and if necessary, alter or amend the CAP to ensure that the plan remains effective and on track toward meeting its targets. The City will use two important types of monitoring: evaluation of the individual measures and evaluation of the plan as a whole.

#### **Measure Evaluation**

The City CAP Coordinator, in coordination with the CAP Implementation Team, will be responsible for developing an annual progress report to the City Council regarding measure implementation. This evaluation may be submitted to the City Council in conjunction with the General Plan status report for that year as required by State Government Code Section 65400. The progress report will:

- Identify the implementation status of each measure (including how new development projects have been implementing CAP measures)
- Evaluate achievement of, or progress toward performance criteria
- Assess the effectiveness of measures included in the CAP
- Report on the State's implementation of state-level measures included in the CAP
- Recommend adjustments to actions or tactics, as needed.

The performance criteria, provided for each quantified measure, identify the level of participation or performance required to achieve the estimated level of GHG emissions reductions by 2020 and 2030.

A monitoring tool was created to easily assess key performance indicators of the CAP measures annually. While a full GHG emissions inventory is necessary to assess community-wide and local government progress toward the 2020 goal, the monitoring tool can track progress between inventories and provide insight on the effectiveness of

specific actions. By evaluating whether the implementation of a measure is on track to achieve its performance criteria, the City can identify successful measures, and re-evaluate or replace under-performing measures.

#### **Plan Evaluation**

Careful tracking of progress of the CAP as a whole is important to ensure that the plan is implemented effectively and to determine the success of GHG mitigation efforts. To evaluate the performance of the CAP as a whole, the City will update the community and municipal GHG inventories every five years using the most up-to-date calculation methods, data, and tools. Inventory updates provide the best indication of CAP effectiveness as they will allow for comparison to the 2005 baseline. If an update reveals that the plan is not making progress toward meeting the GHG reduction target, the City will adjust the measures as necessary.

The City CAP Coordinator, in coordination with the CAP Implementation Team, will be responsible for initiating the inventory updates as well as reporting on the results and progress toward the target in the annual report to the City Council for that year. In addition, the report will include an assessment of the State's implementation of state-level measures included in the CAP to determine whether adjustments to the CAP should be made to account for any shortfalls in their implementation.

At this time, the State has not created a mandate for further reductions beyond the 2020 target. It has identified a long-term goal of reducing emissions to 80 percent below 1990 emissions levels by 2050 (in Executive Order S-3-05), but has not adopted the target and does not plan for meeting this goal. According to the Association of Environmental Professionals (2012), "With statewide emissions reductions making up perhaps two-thirds to three-quarters of the reductions that most local climate action plans currently rely upon to meet 2020 goals, after 2020, it will be highly difficult and likely infeasible for a local jurisdiction to achieve substantial reductions on its own..." (p. 9-12). As such, not all climate action plans have targets for years beyond 2020, and of those that do (typically in the context of a general

plan update), many include targets lower than Executive Order S-3-05 goals for later years to reflect the lack of state or federal measures beyond AB 32. Furthermore, having a feasible and legally defensible reduction target is important to the success of the plan. As the year 2020 approaches, the State is likely to adopt a target for later years and, at that time San Marcos will evaluate its 2030 target for consistency with the State's reduction trajectory.

# 4.3 Funding Sources

One of the main barriers to an implementation and monitoring plan is lack of available funds. There are multiple grant and loan programs through state, federal, and regional sources to reduce GHG emissions. This section identifies potential funding sources that San Marcos could pursue to offset the financial cost of implementing the CAP measures.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. The programs listed below represent the current (2013) status of those options that are most relevant to the CAP. These funding sources could quickly become out-of-date; therefore, it is important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically. In addition, general sources of funding that provide the most up-to-date information should be reviewed on a regular basis. These include:

- U. S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. Department of Housing and Urban Development
- California Energy Commission
- California Strategic Growth Council
- California Public Utilities Commission
- Caltrans
- CAL FIRE

- California Statewide Communities Development Authority
- Foundation for Renewable Energy and Environment
- California Center for Sustainable Energy
- SANDAG
- SDG&E

To reduce costs and improve the CAP's effectiveness, actions should be pursued concurrently whenever possible. Which funding sources the City decides to pursue will be addressed as implementation occurs.

The City can, in part, provide funding for various measures outlined in this CAP. This can be accomplished through the City's annual budgeting and Capital Improvement Program process, which provides an opportunity for citizen input and guides decision-makers while helping them set priorities. The City can also partner with SANDAG, local jurisdictions within San Diego County, community-based organizations, and private companies for joint programs.

#### **Energy-Related Funding Sources**

Many of the financing and incentive programs relevant to the CAP concern energy infrastructure and conservation. Some of these programs are tied to the American Recovery and Reinvestment Act economic stimulus package enacted by Congress in February 2009. Access to these funds will be available for a limited period. The City should seek the most up-to-date information regarding the programs listed below.

# **Energy Efficiency and Conservation Block Grant Program**

U.S. Department of Energy

The Energy Efficiency and Conservation Block Grant program, funded by the American Recovery and Reinvestment Act of 2009, provides local government grants to reduce fossil-fuel emissions, reduce total energy use, and improve energy efficiency and conservation in the transportation and building sectors. Grants originate from U.S. Department of Energy and are released from both the

U.S. Department of Energy and California Energy Commission.

# Strategic Growth Council Sustainable Communities **Planning Grant Program**

California Strategic Growth Council

On behalf of the Strategic Growth Council, the Department of Conservation manages competitive grants to cities, counties, and designated regional agencies to promote sustainable community planning and natural resource conservation. The grant program supports development, adoption, and implementation of various planning elements. The Sustainable Communities Planning Grant Program offers a unique opportunity to improve and sustain the wise use of infrastructure and natural resources through a coordinated and collaborative approach.

## Sustainable Energy Bond Program

California Statewide Communities Development Authority & Foundation for Renewable Energy and Environment

California Statewide Communities Development Authority and the Foundation for Renewable Energy and Environment are teaming together to provide public agencies and nonprofit organizations throughout California with access to tax exempt financing for critical sustainable energy investments. Under the Sustainable Energy Bond Program, participating entities and organizations will contract with an energy service company to complete energy and water conservation measures. Improvements could include street lighting, building lighting, pumps, HVAC, system controls, boilers, chillers, ducting, windows, partial roofing, toilets and others. The program participants will receive substantial utility cost savings, including a contractual guarantee sufficient to cover the full cost of all retrofit work. All projects are financed through tax exempt bonds.

# **Urban Greening for Sustainable Communities Grant Program**

California Strategic Growth Council

Because of the built-out nature of California's urban areas, the Urban Greening for Sustainable Communities Program provides funds to preserve, enhance, increase, or establish community green areas such as urban forests, open spaces,

wetlands, and community spaces (e.g., community gardens). The goal is for these greening projects to incrementally create more viable and sustainable communities throughout the state. This program has both an Urban Greening Planning Program, which provides funds to assist entities in developing a master urban greening plan, and an Urban Greening Project Program, which provides funds for projects that preserve, enhance, increase or establish community green areas.

# **Urban and Community Forestry Grant Program** *CAL FIRE*

The CAL FIRE Urban and Community Forestry Program works to expand and improve the management of trees and related vegetation in communities throughout California. This program offers funding through a variety of grants. The Urban Forest Management Plan Grant funds the development and implementation of a management plan to be used by a jurisdiction to manage its urban forest. Such plans will be holistic and long-term, must include the entire jurisdiction and take an ecosystem management approach, and may include a minimum level of a training or educational component. Local jurisdictions may request between \$30,000 and \$100,000 and matching contributions totaling 25 percent of the total project cost is required. The Green Trees for the Golden State Grant provides funding for urban tree planting projects and up to two years of initial maintenance. Local jurisdictions may request between \$30,000 and \$100,000. Matching contributions totaling 25 percent of the total project cost is required.

# **California Inventor Owned Utilities (IOUs) Programs** *SDG&E*

California IOU's, such as SDG&E, are required by the California Public Utilities Commission to offer energy efficiency programs to their customers. Each IOU program is unique; generally the programs offer rebates, financing assistance, design assistance, educational seminars, and other forms of assistance. Rebates are typically a set amount of financial assistance for a specific energy efficiency technology, although SDG&E also offers custom rebate programs that are more flexible.

In conjunction with its rebates and incentives programs, SDG&E offers On-Bill Financing. On-Bill Financing provides interest-free, unsecured financing to qualified commercial and government-funded customers for the installation of energy-efficient upgrades. Financed equipment must qualify for a rebate or incentive from SDG&E's rebate/incentive program(s). The program for public agencies, such as the City of San Marcos, includes: zero-percent financing on qualifying measures for up to ten years; offsets to energyefficient upgrade costs after rebates and incentives through SDG&E; loan amounts that range from a minimum of \$5,000 up to \$250,000 per meter; and loan installments that are added to monthly SDG&E bills.

# **Energy Conservation Assistance Account Program** (ECAA) Energy Efficiency Financing

California Energy Commission

The California Energy Commission offers low-interest loans (1-3 percent) to help local jurisdictions and other public agencies finance energy-efficient projects as part of the Energy Conservation Assistance Account program. Projects with proven energy and/or capacity savings are eligible, provided that they meet the eligibility requirements. Examples of projects include: lighting systems, pumps and motors, energy efficient streetlights and traffic signals, automated energy management systems/controls, building insulation, renewable energy generation and combined heat power projects, heating and air conditioning modifications, and waste water treatment equipment. The maximum loan amount is \$3 million per application for 15 years. There is no minimum loan amount.

#### California Solar Initiative State Rebate Program

California Energy Commission & California Public Utilities Commission

California Solar Initiative will provide over \$2 billion in statewide incentives over the next decade for solar photovoltaic systems, as well as other solar thermal generating technologies, such as water heaters, on existing residential homes, and existing and new commercial, industrial, and agricultural properties. Photovoltaic incentives are available for systems up to one megawatt in size for homeowners, commercial/industrial, government and non-profit customers. The program pays solar consumers an incentive based on system performance.

#### **California Feed-In Tariff**

The California feed-in tariff allows eligible customergenerators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to three megawatts -- at time-differentiated market-based prices. Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative, Self-Generation Incentive Program, Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs. For customers generating renewable energy not covered by the California Solar Initiative or Self-Generation Incentive Program (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

#### **Training and Technical Assistance Programs**

California Center for Sustainable Energy (CCSE) and SDG&E

CCSE and SDG&E conduct expert-facilitated workshops and seminars on a broad spectrum of energy topics and issues, from the latest in green building and advanced lighting technologies to do-it-yourself "energy smart" remodeling. A variety of technical resources and a schedule of workshops and events are available on the CCSE website.

CCSE staff also conducts offsite outreach and educational activities by attending community and industry events to promote energy efficiency.

#### Transportation-Related Funding Sources

Many federal, state, and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs.

#### **Livability Grant Program**

Federal Transportation Authority

The Federal Transportation Authority provides resources on sustainable communities and transit oriented development. This includes access to transit oriented development resources and training free of charge to local government employees. The Federal Transportation Authority's Livable and Sustainable Communities program supports initiatives that demonstrate ways to improve the link between public transit and communities. The Federal Transportation Authority offers a broad selection of Livability Grant Programs that fund projects for accessible, livable, and sustainable communities. In particular, the Bus and Bus Facilities Discretionary Program provides capital assistance for new buses and intermodal transit centers. The New Starts and Small Starts Program supports transit "guideway" capital investments, such as rapid rail, light rail, commuter rail, automated guideway transit, people movers, bus rapid transit, and other high occupancy vehicles. Additionally, the Intercity Bus Program supports transit access to residents in non-urbanized areas.

#### Alternative and Renewable Fuel and Vehicle **Technology Program**

California Energy Commission

Assembly Bill 118 created the Alternative and Renewable Fuel and Vehicle Technology Program, within the California Energy Commission. The statute authorizes the Energy Commission to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's GHG reduction goals and reduce our dependence on foreign oil. The statute allows the Energy Commission to use grants, loans, loan guarantees, revolving loans, and other appropriate measures. Eligible recipients include: public agencies, private businesses, public-private partnerships, vehicle and technology workforce consortia, training partnerships collaboratives, fleet owners, consumers, recreational boaters, and academic institutions. The Energy Commission must prepare and adopt an Investment Plan and convene an Advisory Committee to assist in preparing the Investment Plan. The Energy Commission has an annual program budget of approximately \$100 million.

# **Community-Based Transportation Planning Grant Program**

**Caltrans** 

The Community-Based Transportation Planning Grant Program is primarily used to seed planning activities that encourage livable communities. Grants assist local agencies to better integrate land use and transportation planning, to develop alternatives for addressing growth, and to assess efficient infrastructure investments that meet community needs. These planning activities are expected to help leverage projects that foster sustainable economies, increase available affordable housing, improve housing/jobs balance, encourage transit oriented and mixed use development, expand transportation choices, reflect community values, and include non-traditional participation in transportation decision making.

## **Local Assistance Program**

**Caltrans** 

Caltrans' Local Assistance Program oversees more than one billion dollars in federal and state funds annually available to over 600 cities, counties, and regional agencies for the purpose of improving their transportation infrastructure or providing transportation services.

#### **Safe Routes to School Programs**

**Caltrans** 

Caltrans administers two separate Safe Routes to School Programs—one state program and one federal program. Both programs are intended to achieve the same basic goal of increasing the number of children walking and bicycling to school by making it safer for them to do so. Both programs fund qualifying infrastructure projects.

## **Bicycle Transportation Account**

**Caltrans** 

The Bicycle Transportation Account is an annual program providing state funds for city and county projects that improve safety and convenience for bicycle commuters. Caltrans expects to appropriate \$7.2 million annually for projects, on a matching basis with local jurisdictions. A wide

variety of projects are eligible, including but not limited to new bikeways serving major transportation corridors, new bikeways removing travel barriers, and secure bicycle parking.

# **Environmental Enhancement and Mitigation Program** *Caltrans*

The Environmental Enhancement and Mitigation Program offers a total of \$10 million each year for grants to local, state, and federal government agencies and to nonprofit organizations for projects to mitigate the environmental impacts caused by new or modified public transportation facilities. Eligible projects must be directly or indirectly related to the environmental impact of the modification of an existing transportation facility or construction of a new transportation facility. Two of the grant categories include Highway Landscaping and Urban Forestry Projects, which are designed to offset vehicular emissions of carbon dioxide through the planting of trees and other suitable plants, and Roadside Recreation Projects, which provide for the acquisition and/or development of roadside recreational opportunities.

# **Highway Safety Improvement Program** *Caltrans*

The Highway Safety Improvement Program provides federal funding for work on any public road or publicly owned bicycle/pedestrian pathway or trail that corrects or improves the safety for its users. The program is intended to reduce traffic fatalities and serious injuries on all public roads. Local jurisdictions, such as counties and cities, may apply to Caltrans for funding ranging from \$100,000 to \$900,000 per project. Federal reimbursements cover up to 90 percent of total project costs. Eligible projects include, but are not limited to, improvements for pedestrian or bicyclist safety, intersection safety improvements, and shoulder widening.

#### **Community Development Block Grant**

California Department of Housing and Community Development

The Community Development Block Grant (CDBG) program funds projects and programs that develop viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low and moderate income. Federal CDBG Grantees may use funds for activities that include, but are not limited to, acquiring real property; building public facilities and improvements, such as streets, sidewalks, and recreational facilities; and planning and administrative expenses, such as costs related to developing a consolidated plan and managing CDBG funds. The State makes funds available to eligible agencies (cities and counties) through a variety of different grant programs.

### **Infill Infrastructure Grant Program**

California Department of Housing and Community Development

The Infill Infrastructure Grant Program assists in the new construction and rehabilitation of infrastructure that supports higher-density affordable housing and mixed-income housing in locations designated as infill. Eligible applicants include, but are not limited to, localities and public housing authorities.

## **National Recreational Trails Program**

California Department of Parks and Recreation

In California, the National Recreational Trails Program is administered by the Department of Parks and Recreation to provide funding to develop recreational trails and related facilities for uses such as bicycling and hiking.

# **TransNet Smart Growth Incentive Program** *SANDAG*

SANDAG manages the TransNet Smart Growth Incentive Program, which funds transportation and transportation-related infrastructure improvements and planning efforts that support smart growth development. The program awards two percent of the annual TransNet revenues to local governments through a competitive grant program.

# **TransNet Environmental Mitigation Program** *SANDAG*

The TransNet Environmental Mitigation Program provides funding for mitigating local and regional transportation projects, as well as additional funding for acquiring, managing, and monitoring natural habitats in ways that support the San Diego region's habitat conservation programs.

## **TransNet Active Transportation Grant Program** SANDAG

SANDAG allocates funds under the Active Transportation Grant Program to support pedestrian and bicvcle infrastructure and facilities that promote multiple travel choices for residents.

## **Infrastructure State Revolving Fund Program**

California Infrastructure and Economic Development Bank

The Infrastructure State Revolving Fund Program provides low-cost financing to public agencies for a wide variety of infrastructure projects. Program funding is available in amounts ranging from \$250,000 to \$10 million, with loan terms of up to 30 years. Eligible project categories include city streets, county highways, state highways, drainage, water supply and flood control, educational facilities, environmental mitigation measures, parks and recreational facilities, port facilities, public transit, sewage collection and treatment, solid waste collection and disposal, water treatment and distribution, defense conversion, public safety facilities, and power and communications facilities.

## Solid Waste-Related Funding Sources

# Beverage Container Recycling Grant and Payment **Programs**

California Department of Resources Recycling and Recovery (CalRecycle)

CalRecycle administers funding assist programs to organizations with establishing convenient beverage container recycling and litter abatement projects, and to encourage market development and expansion activities for beverage container materials. The Beverage Container Recycling Grant provides funding to local governments, businesses, individuals, and non-profit organizations for projects that implement new programs or enhance existing programs to provide convenient beverage container recycling opportunities in various locations statewide. Eligible projects include, but are not limited to, the following locations: parks and recreational areas, sporting complexes, community events, office buildings, multifamily dwellings, restaurants, and schools and colleges. CalRecycle issues up to \$1.5 million annually for this program. The City/County Payment Program provides a total of \$10.5 million in grant funds annually to eligible cities and counties for beverage container recycling and litter abatement activities. Each city is eligible to receive a minimum of \$5,000 or an amount calculated by the Department based on per capita, whichever is greater.

## **Other Funding Sources**

#### **Community Assistance Grant**

Bureau of Land Management

Funds are available to assist with hazardous fuels treatments, community wildfire protection planning, and education addressing wildfire safety and hazard risk reduction within the wildland-urban interface. Treatments may be focused on both Federal (with prior approval from local Bureau of Land Management field staff) and nonfederal lands and aimed toward protecting communities at risk and resource values identified within a Community Wildfire Protection Plan and/or Community Fire Plans with an interdisciplinary and interagency collaborative process.

#### **Wildland Urban Interface Grant**

Fish and Wildlife Service

Wildland Urban Interface funds are available for hazard mitigation projects that protect communities at risk of wildfire by reducing hazardous fuels (non-federal lands), developing Community Wildfire Protection Plans (includes associated planning and compliance documents), and implementing wildfire education and outreach initiatives.

# Partnerships with Other Jurisdictions and Community Organizations

Partnering with neighboring jurisdictions and community organizations is a key implementation strategy supporting the CAP. Various jurisdictions and organizations within the County could serve as potential partners in implementing the CAP strategies. The City should seek to partner with appropriate local governments, as identified within CAP measures.

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